



United States Environmental Protection Agency
Washington, DC 20460

Completion Form For Injection Wells

Administrative Information

1. Permittee Florence Copper Inc.

Address (Permanent Mailing Address) (Street, City, and ZIP Code)

1575 W Hunt Hwy, Florence, AZ 85132

2. Operator Florence Copper Inc.

Address (Street, City, State and ZIP Code)

1575 W Hunt Hwy, Florence, AZ 85132

3. Facility Name
Florence Copper Inc.

Telephone Number
(520) 374-3984

Address (Street, City, State and ZIP Code)

1575 W Hunt Hwy, Florence, AZ 85132

4. Surface Location Description of Injection Well(s)

State	County
Arizona	Pinal

Surface Location Description

SE 1/4 of SW 1/4 of NE 1/4 of SW 1/4 of Section 28 Township 4S Range 9E

Locate well in two directions from nearest lines of quarter section and drilling unit

Surface

Location 1080 ft. frm (N/S) N Line of quarter section
and 975 ft. from (E/W) E Line of quarter section.

- | | | |
|--|--|---|
| <p><input type="checkbox"/> Class I
 <input type="checkbox"/> Class II
 <input type="checkbox"/> Brine Disposal
 <input type="checkbox"/> Enhanced Recovery
 <input type="checkbox"/> Hydrocarbon Storage
 <input checked="" type="checkbox"/> Class III
 <input type="checkbox"/> Other</p> | <p><input type="checkbox"/> Operating
 <input type="checkbox"/> Modification/Conversion
 <input type="checkbox"/> Proposed</p> | <p><input type="checkbox"/> Individual
 <input checked="" type="checkbox"/> Area : Number of Wells 33</p> |
|--|--|---|

Lease Number NA

Well Number I-02

Submit with this Completion Form the attachments listed in Attachments for Completion Form.

Certification

I certify under the penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment (Ref. 40 CFR 144.32)

Name and Official Title (Please type or print)

Ian Ream, Senior Hydrogeologist

Signature

Date Signed

9-12-2018

PAPERWORK REDUCTION ACT

The public reporting and record keeping burden for this collection of information is estimated to average 49 hours per response for a Class I hazardous facility, and 47 hours per response for a Class I non-hazardous facility. Burden means the total time, effort, or financial resource expended by persons to generate, maintain, retain, or disclose or provide information to or for a Federal Agency. This includes the time needed to review instructions; develop, acquire, install, and utilize technology and systems for the purposes of collecting, validating, and verifying information, processing and maintaining information, and disclosing and providing information; adjust the existing ways to comply with any previously applicable instructions and requirements; train personnel to be able to respond to the collection of information; search data sources; complete and review the collection of information; and, transmit or otherwise disclose the information. An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless it displays a currently valid OMB control number. Send comments on the Agency's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, including the use of automated collection techniques to Director, Collection Strategies Division, U.S. Environmental Protection Agency (2822), 1200 Pennsylvania Ave., NW, Washington, D.C. 20460. Include the OMB control number in any correspondence. Do not send the completed forms to this address.

Attachments to be submitted with the Completion report:

I. Geologic Information

1. Lithology and Stratigraphy

A. Provide a geologic description of the rock units penetrated by name, age, depth, thickness, and lithology of each rock unit penetrated.

B. Provide a description of the injection unit.

- (1) Name
- (2) Depth (drilled)
- (3) Thickness
- (4) Formation fluid pressure
- (5) Age of unit
- (6) Porosity (avg.)
- (7) Permeability
- (8) Bottom hole temperature
- (9) Lithology
- (10) Bottom hold pressure
- (11) Fracture pressure

C. Provide chemical characteristics of formation fluid (attach chemical analysis).

D. Provide a description of freshwater aquifers.

- (1) Depth to base of fresh water (less than 10,000 mg/l TDS).
- (2) Provide a geologic description of aquifer units with name, age, depth, thickness, lithology, and average total dissolved solids.

II. Well Design and Construction

- 1. Provide data on surface, intermediate, and long string casing and tubing. Data must include material, size, weight, grade, and depth set.
- 2. Provide data on the well cement, such as type/class, additives, amount, and method of emplacement.
- 3. Provide packer data on the packer (if used) such as type, name and model, setting depth, and type of annular fluid used.

4. Provide data on centralizers to include number, type and depth.

5. Provide data on bottom hole completions.

6. Provide data on well stimulation used.

III. Description of Surface Equipment

1. Provide data and a sketch of holding tanks, flow lines, filters, and injection pump.

IV. Monitoring Systems

1. Provide data on recording and nonrecording injection pressure gauges, casing-tubing annulus pressure gauges, injection rate meters, temperature meters, and other meters or gauges.

2. Provide data on constructed monitor wells such as location, depth, casing diameter, method of cementing, etc.

V. Logging and Testing Results

Provide a descriptive report interpreting the results of geophysical logs and other tests. Include a description and data on deviation checks run during drilling.

VI. Provide an as-built diagrammatic sketch of the injection well(s) showing casing, cement, tubing, packer, etc., with proper setting depths. The sketch should include well head and gauges.

VII. Provide data demonstrating mechanical integrity pursuant to 40 CFR 146.08.

VIII. Report on the compatibility of injected wastes with fluids and minerals in both the injection zone and the confining zone.

IX. Report the status of corrective action on defective wells in the area of review.

X. Include the anticipated maximum pressure and flow rate at which injection will operate.

TECHNICAL MEMORANDUM

14 September 2018

File No. 129687-010

TO: Florence Copper Inc.
Ian Ream, Senior Hydrogeologist

FROM: Haley & Aldrich, Inc.
Lauren Candreva, R.G.

Subject: Drilling, Installation, and Integrity Testing Summary
PTF Injection Well I-02
Florence Copper Inc., Florence, Arizona



This document summarizes the drilling, installation, and testing of Production Test Facility (PTF) injection well I-02 for Florence Copper Inc. (Florence Copper) in Florence, Arizona, including the equipment used to perform the work, completion, and the results of well testing activities. Separate well completion reports have been created for each PTF well.

The Arizona Department of Water Resources Registry ID for well I-02 is 55-227964 and the Well Registry Report is included in Appendix A. The well is located in the southwest quarter of the northeast quarter of the southwest quarter of Section 28 of Township 4 north, Range 9 East of the Gila and Salt River Baseline and Meridian (D(4-9)28CAC). Well I-02 is located within the Underground Injection Control (UIC) Permitted Area of Review (AOR) for UIC Permit R9UIC-AZ3-FY11-1 and was completed as a Class III injection well for the PTF (Figure 1).

Florence Copper contracted Hydro Resources, Inc. (Hydro Resources) to drill, install, and test well I-02 in accordance with *Well Specification: Drilling, Installation, and Testing of Class III Injection and Recovery Wells, Production Test Facility, Florence, Arizona* (Haley & Aldrich, Inc. [Haley & Aldrich], 2017). A Midway 3500 drilling rig was used for all drilling and construction activities. Haley & Aldrich provided oversight of drilling activities, geophysical logging, well installation, and testing. All reported depths are in feet below ground surface unless otherwise noted.

I. Geologic Information

1. Lithology and Stratigraphy

A. Geology of Penetrated Units

The geology penetrated during the drilling of Class III well I-02 is summarized below and a lithologic log is included in Appendix B.

Lithologic Unit Name	Depth to Bottom of Unit (feet)	Thickness of Unit (feet)	Lithology and Age of Unit
Upper Basin Fill Unit (UBFU)	280	280	Alluvium; Quaternary to Tertiary
Middle Fine-Grained Unit (MFGU)	300	20	Alluvium; Tertiary
Lower Basin Fill Unit (LBFU)	380	80	Alluvium; Tertiary to Cretaceous
Bedrock Oxide Unit (Oxide)	Not encountered	>839	Igneous porphyry; Precambrian

B. Description of Injection Unit

Parameter	Bedrock Oxide Unit
Depth Drilled	1,219 feet
Thickness	>839 feet
Formation Fluid Pressure	Atmospheric plus head of freshwater; no additional formation pressure
Age of Unit	Precambrian with intrusions of Precambrian to Tertiary rocks
Porosity ¹	Average = 7.3%
Permeability	Hydraulic conductivity = 0.56 feet per day
Bottom Hole Temperature	34.5 degrees Celsius
Lithology	Igneous porphyry: quartz monzonite, granodiorite with diabase and andesite dykes (detailed log included in Appendix B)
Bottom Hole Pressure	Approximately 430 pounds per square inch (PSI) (pressure exerted by the column of freshwater with no additional contribution from formation pressure)
Fracture Pressure	0.65 PSI per foot

¹ Porosity values calculated from neutron borehole survey conducted at Injection Well I-02.

C. Chemical Characteristics of Formation Fluid

The chemical characteristics of the formation fluid in the injection zone are summarized below and are the results of the sampling of the center PTF wellfield well R-09. The table below summarizes the primary chemical characteristics detected in a formation fluid sample collected on 23 April 2018; the complete analytical report is included in Appendix C.

Analyte	Result (mg/L)
Metals	
Aluminum	<0.08
Antimony	<0.005
Arsenic	0.0016
Barium	0.071
Beryllium	<0.0005
Cadmium	<0.00025
Calcium	140
Chromium	0.0051
Cobalt	<0.00025
Copper	0.011
Iron	<0.30
Lead	<0.0005
Magnesium	27
Manganese	0.002
Mercury	<0.001
Nickel	0.0033
Potassium	6.8
Selenium	<0.0025
Sodium	170
Thallium	<0.0005
Zinc	<0.04
Anions	
Bicarbonate	150
Chloride	310
Fluoride	<0.5
Nitrate	8.8
Sulfate	190
Field Parameters	
Total Dissolved Solids	1,000
pH	7.8
Radiochemicals	
Uranium	0.016
Notes: mg/L = milligrams per liter	

Sampling results for well I-02 are included in the *PTF Mine Block Ambient Groundwater Concentrations and Initial Discharge Characterization of the Underground Workings* (Brown and Caldwell, 2018).

D. Description of Freshwater Aquifers

- 1) The depth to the base of the freshwater aquifer is defined by the interface at which deeper formation fluid exhibits a total dissolved solids (TDS) value of 10,000 milligrams per liter (mg/L). The depth of the 10,000 mg/L interface is deeper than all the wells drilled at the site and consequently has not been defined.
- 2) A geologic description of the aquifer units is included below:

Aquifer Unit Name	Age	Depth (feet)	Thickness (feet)	Lithology	Average Total Dissolved Solids ¹ (mg/L)
UBFU	Quaternary/Tertiary	0 to 280	280	Alluvium	914
LBFU	Tertiary	300 to 380	80	Alluvium	754

¹ Average TDS values calculated from UBFU and LBFU monitoring well ambient monitoring results near the PTF.

II. Well Design and Construction

1. Well I-02 casing installed:

Casing	Material	Diameter (inches)	Weight (pounds per foot)	Depth (feet)	Borehole Diameter (inches)	Drilling Method
Surface	Mild steel	24 O.D. 23½ I.D.	94.71	0 to 40	30	Solid-stem auger
Overburden (intermediate)	Mild steel – bottom 40 feet poly-coated	14 O.D. 13½ I.D.	47.36	0 to 500	20	Reverse flooded rotary
Well casing	FRP	5.47 O.D. 4.74 I.D.	5.40	-1 to 520	Inside overburden casing to 500; 12½	Inside overburden casing/reverse flooded rotary
Screen	PVC Sch. 80 with 0.080-inch-wide slots	5.56 O.D. 4.81 I.D.	4.08	520 to 641 660 to 881 900 to 1,201	12½	Reverse flooded rotary
Blank intervals	Stainless steel Sch. 40 – Type 316L	5.56 O.D. 5.047 I.D.	14.75	641 to 660 881 to 900	12½	Reverse flooded rotary

Notes:

FRP = fiberglass-reinforced plastic
I.D. = inside diameter
O.D. = outside diameter

PVC = polyvinyl chloride
Sch. = Schedule

2. Well Cement

Cement Interval	Cement Type	Additives	Amount Installed (cubic yards)	Method of Emplacement
Surface casing	Type V Neat 21 sack slurry	None	5	Submerged tremie
Overburden casing	Type V Neat 21 sack slurry	None	33.2	Displacement – installed through drillable grout shoe with one-way stab-in valve and welded to the bottom of the casing
Well casing	Type V Neat 21 sack slurry	None	16.3	Submerged tremie

Field forms documenting pipe tallies, annular materials and cement tickets are included in Appendix D.

3. Annular Packers

No annular packers were used during construction of well I-02.

4. Centralizers

Casing	Centralizer Type	Number and Spacing
Overburden	Mild steel – welded	12 installed – every 40 feet
Well – FRP and PVC	Stainless steel – heavy duty	27 installed – every 40 feet
Notes: FRP = fiberglass reinforced plastic PVC = polyvinyl chloride		

5. Bottom Hole Completion

There is no bottom hole completion, as this is not an oil/gas well. The well was completed at the bottom with a stainless-steel endcap of the same diameter as the well screen.

6. Well Stimulation

No well stimulation was used during the drilling and construction of well I-02.

III. Description of Surface Equipment

1. Surface Equipment

Well I-02 is an injection well and has been equipped with an inflatable packer. The 2-inch diameter injector pipe extends from the well head and into the manifold that conveys the injection fluid from the plant on-site. A diagram of the wellhead is included as Figure 2.

IV. Monitoring Systems

1. Well Monitoring Equipment

Equipment Type	Location	Type	Purpose
Pressure transducer	Well casing – approximately 400 feet bgs	Recording	Monitor water column/pressure
Pressure transducer	Well casing – on packer at 645 feet bgs	Recording	Monitor water column/pressure
Flow meter	Wellhead	Recording	Monitor injection rate
Pressure transducer	Wellhead	Recording	Monitor wellhead pressure
Notes: <i>bgs = below ground surface</i>			

2. Monitoring Wells

A total of 16 monitoring wells are associated with the PTF: 7 point-of-compliance (POC) wells, 7 United States Environmental Protection Agency (USEPA) supplemental monitoring wells, and 2 operational monitoring wells. The POC wells are located outside the AOR and are not constructed as Class III wells. The supplemental monitoring and operational monitoring wells are located within the AOR and are constructed as Class III wells as required by the UIC Permit. The wells are summarized in the tables below by type.

POC Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval (feet)	Screened Lithologic Unit
M14-GL	846750.23 746461.52	859	5 9/16 OD	Submerged tremie	778 to 838	LBFU
M15-GU	846697.17 746464.82	615	5 9/16 OD	Submerged tremie	554 to 594	LBFU
M22-O	846751.26 746514.47	1,140	5 9/16 OD to 528 feet; 4 1/2 OD to 1,140 feet	Submerged tremie	932 to 1,130	Oxide

POC Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval (feet)	Screened Lithologic Unit
M23-UBF	846688.13 746512.48	250	6 5/8 OD	Submerged tremie	210 to 250	UBFU
M52-UBF	851092.00 774178.00	274	5 9/16	Submerged tremie	198 to 273	UBFU
M54-LBF	847331.96 746682.61	630	5 9/16	Submerged tremie	310 to 629	LBFU
M54-O	847342.99 746702.36	1,199	5 9/16	Submerged tremie	668 to 1,198	Oxide

OD = outside diameter

Supplemental Monitoring Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval (feet)	Screened Lithologic Unit
M55-UBF	847541.46 746280.63	261	5	Submerged tremie	240 to 260	UBFU
M56-LBF	847518.70 746303.41	340	5	Submerged tremie	320 to 340	LBFU
M57-O	847378.37 746248.93	1,200	5	Submerged tremie	523 to 1,199	Oxide
M58-O	847672.23 746595.97	1,200	5	Submerged tremie	594 to 1,199	Oxide
M59-O	847934.95 746218.89	1,201	5	Submerged tremie	534 to 1,199	Oxide
M60-O	847599.37 745903.70	1,201	5	Submerged tremie	444 to 1,200	Oxide
M61-LBF	848184.46 746148.88	629	5	Submerged tremie	429 to 629	LBFU

Operational Monitoring Wells						
Well ID	Location X/Y (State Plane NAD 83)	Depth (feet)	Well Nom. Diameter (inches)	Cementing Method	Screened Interval	Screened Lithologic Unit
MW-01-LBF	847487.97 746360.54	444	5	Submerged tremie	330 to 440	LBFU
MW-01-O	847499.04 746369.31	1,200	5	Submerged tremie	500 to 1,200	Oxide

V. Logging and Testing Results

Borehole geophysical logging was conducted on well I-02 in four phases: 1) open-hole surveys in the 20-inch borehole prior to installation of the overburden casing; 2) cased-hole surveys in the 14-inch casing; 3) open-hole surveys in the 12.25-inch borehole prior to installation of the well casing and screen; and 4) cased-hole surveys in the completed well.

The open-hole geophysical surveys completed at well I-02 included:

- Spontaneous potential;
- Natural gamma;
- Electrical resistivity (short and long normal);
- Neutron;
- Caliper with calculated volume;
- Temperature;
- Sonic; and
- Deviation.

The cased-hole geophysical surveys completed included:

- Cement bond log (overburden steel casing);
- Sonic (for cement bond with fiberglass reinforced plastic [FRP]);
- 4 pi density (for cement bond with FRP);
- Dual density (for cement bond with FRP);
- Natural gamma;
- Fluid conductivity;
- Temperature; and
- Gyroscopic deviation.

Open-hole geophysical surveys were used to support identification of the lithologic contacts, to evaluate the condition of the borehole, and to evaluate the deviation of the borehole.

The primary logs used to evaluate the lithologic contacts were natural gamma ray, short (16-inch) and long (64-inch) normal electrical resistance, and single-point resistance. The neutron survey was primarily used to evaluate the porosity of the formation; it was only conducted on select wells.

The lithologic contacts for the Middle Fine-Grained Unit (MFGU) were selected based on the short and long resistance and the single-point resistance. All the resistivity values decreased and remained consistently low through the MFGU. This contact is generally characterized by a relatively sharp

decrease in resistance at the top of the unit and a gradual increase in resistance below the bottom of the unit.

The contact between the Lower Basin Fill Unit (LBFU) and the bedrock was identified primarily using the natural gamma and correlated with the resistance logs. There is a consistent increase in gamma values at the contact between the LBFU and the bedrock that was identified and documented at the site during exploration in the 1990s. For well I-02, the gamma values are consistent at approximately 50 American Petroleum Institute (API) units throughout the Upper Basin Fill Unit (UBFU) and MFGU, increase slightly to approximately 60 API units in the LBFU, and then increase at 380 feet to over 110 API units. After the increase at 380 feet, the natural gamma begins to vary more than in the alluvial units. This change in the response of the natural gamma indicates the contact with the bedrock unit. Also, at this approximate depth, the resistance increases likely because the bedrock contains less water leading which increases the resistance of the formation.

Cased-hole geophysical surveys were conducted to evaluate the cement seal and the casing-cement bond, to document baseline fluid temperature and conductivity, and to evaluate the plumbness of the well. The cement bond is discussed in Section VII.

Copies of all the open-hole geophysical logs and cased-hole temperature, fluid conductivity, and natural gamma logs are included in Appendix E; a figure summarizing the open-hole logs used to evaluate geology is included as Figure 3. The cased-hole logs used to evaluate the cement bond are included in Appendix E.

VI. Well As-Built Diagram

An as-built diagram for well I-02 is included as Figure 4. A diagram showing the wellhead completion is included as Figure 2.

VII. Demonstration of Mechanical Integrity

A demonstration of Part I mechanical integrity of the well was completed using a standard annular pressure test (SAPT) in accordance with Part II.E.3.a.i.A of the UIC Permit. Mechanical integrity will be demonstrated every 2 years during operations and will be confirmed by daily injection pressure monitoring that will be conducted per the UIC Permit once the well is operational. The SAPT for Well I-02 is summarized below.

The SAPT was conducted by installing an inflatable straddle packer assembly in the well. The bottom packer was installed near the bottom of the FRP-cased portion of the well, the top packer was near the surface, the packers were inflated to form a seal against the casing. The bottom 5 feet of the packer drop pipe was perforated to allow for communication between the tubing and the annulus of the packer assembly. The drop pipe extended through the wellhead and a high pressure/low volume pump was

attached to the drop pipe to pressurize the test interval. A valve on the drop pipe at the surface was used to isolate the test interval once the planned test pressure was achieved.

An In-Situ LevelTROLL® pressure transducer with a data logger was installed at the well head and was connected to the packer assembly annulus interval via a National Pipe Thread adapter. The LevelTROLL was used to monitor and record pressure inside the well during the SAPT. To conduct the SAPT, water was pumped from a nearby well immediately prior to testing. Before the water was pumped into the test well, the water temperature was measured to ensure that it was similar to the ambient groundwater temperature of the test well to reduce the potential of differential temperature effects on the well casing. The SAPT for the Class III well was conducted by applying hydraulic pressure to the well casing and shutting in pressure between the packer and wellhead assembly, monitoring the shut-in pressure for a 30-minute period, then measuring the volume of water returned from the well casing after the pressure was released.

On 21 April 2018, the packer was installed to approximately 506 feet and the SAPT was conducted successfully three times. The USEPA SAPT form, a table of the data, and a chart of the data is provided in Appendix F.

Part II mechanical integrity is demonstrated by the cementing records included in this report (in accordance with Part II.E.3.ii.C of the UIC Permit) and will be demonstrated during operations by annular conductivity monitoring on the observation and multi-level sampling wells (in accordance with Part II.E.3.a.ii.A of the UIC Permit).

Cemented Interval	Cement Type	Calculated Grout Volume (cubic yards)	Installed Grout Volume (cubic yards)
Surface casing	Type V 21 sack neat cement slurry	2.6	5
Overburden casing	Type V 21 sack neat cement slurry	26.5	33.2
Well casing	Type V 21 sack neat cement slurry	15.6	16.3

On 7 December 2017, a cement bond log was run on the overburden casing. On 23 March 2018, a suite of logs was run over the entire length of the completed well to verify the grout seal; a geophysical log summary of the logs completed to demonstrate cement bond are included in Appendix G.

The cement bond of the steel casing was evaluated by the geophysical contractor by calculating a bond index. The bond index based on the cement bond log was calculated to be an average of 85 percent over the cement grouted interval from 5 to 498 feet. This data is included on the summary log in Appendix G. A sonic log was also run in the steel casing and the results of the sonic log indicate a consistent density in the interval which supports the cement bond log data.

There is not a bond log tool designed to evaluate cement bond with FRP casing, so the cement interval with the FRP casing was evaluated using density logs. Based on the measured density of the cased interval, no significant cement deficiencies were noted in the sonic data collected from the water table

approximately 240 to 481 feet, and no significant deficiencies were noted in the 4pi density data collected from 15 to 481 feet. There were some very localized, low density intervals identified in the density logs but they were insignificant, only extending 2 to 3 feet. A summary of the FRP cased data is included in the well completion summary in Appendix G.

VIII. Compatibility of Injected Waste

The Florence Copper Project is a Class III mineral extraction project and does not include the injection of any waste products of any kind. The injected fluid (lixiviant) is a carefully constituted in-situ copper recovery solution that will be recovered and recycled following injection.

The compatibility of the lixiviant was evaluated as part of the geochemical modeling completed by Florence Copper and summarized in the *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona* (Daniel B. Stephens Inc., 2014) which was included in Attachment H of the UIC Permit Application.

IX. Status of Corrective Action on Defective Wells in the Area of Review

There are not currently any defective wells in the AOR.

X. Maximum Pressures and Flow Rates for I-02

Maximum Operating Pressure	Maximum Flow (Injection)
104 PSI	60 gpm
Notes:	
gpm = gallons per minutes	
psi = pounds per square inch	

The maximum operating pressure was calculated using the permitted fracture gradient limit of 0.65 psi per foot and the estimated weight of the mature raffinate solution of 0.45 psi per foot. This well is an injection well used to inject solution and the permitted maximum injection flow rate is 60 gallons per minute (gpm).

XI. Well Development

Well I-02 was developed by the airlift method, followed by pumping; development was completed by Hydro Resources using a workover rig. To purge drilling fluids and solids, the well was airlift developed from 3 to 11 March 2018 at depths ranging from 420 to 1,200 feet. During development, the airlift pump was cycled to surge the well. On 8 March 2018, approximately 39 gallons of chlorine were added

to the well to break down the polymer mud used during drilling and to aid in well development. The discharge was cloudy with minimal sand content at the end of the airlift development period.

A submersible pump was temporarily installed at approximately 1,160 feet on 14 March 2018 for use in well development. Pump development was conducted at approximately 60 to 75 gpm from 14 to 16 March 2018, during which time the submersible pump was periodically cycled to surge the well and the pump was raised in the well as discharge cleared. The discharge was visually clear throughout the pump development period, and turbidity values were less than 5 Nephelometric Turbidity Units at the end of the development period and discharge was free of chlorine. Well development forms are included in Appendix H.

XII. Well Completion

A well video survey was conducted on 21 March 2018; the video log report is included as Appendix I. The video log depths are presented in feet below the top of the casing and thus vary slightly from what is recorded; however, these values are the same with the correction for stick up.

The video log indicates the total depth reached was 1,126 feet (to the top of soft fill).

A gyroscopic survey was also conducted on the completed well on 21 March 2018, and the results are included in Appendix I.

The surveyed location for well I-02 is as follows:

Northing (feet)	Easting (feet)	Measuring Point Elevation (feet amsl)
746131.73	847765.01	1480.37

Notes:
Northing and easting locations provided in State Plane North American Datum 1983; vertical location provided in North American Vertical Datum 1988.
amsl = above mean sea level

XIII. Downhole Equipment

On 23 July 2018, the permanent equipment was installed in the well, including the following:

- Inflatable Packers International packer;
- 2-inch Schedule 120 threaded and coupled polyvinyl chloride (PVC) column pipe with 316L stainless steel couplers from the packer to approximately 350 feet;
- 2-inch Schedule 40 threaded and coupled 316L stainless steel column pipe with 316L stainless steel couplers from approximately 300 feet to the wellhead;

- Pressure transducer in the well above the packer, and pressure transducer in communication with the zone below the packer through a feed-through port on the packer; and
- 1-inch nominal diameter sounding tube to 500 feet.

The type and depth of equipment installed in each well is not constrained by the UIC Permit or the Aquifer Protection Permit (APP). This information is provided in accordance with Section 2.7.4.3 of the APP. Operational considerations may require that the type and depth of equipment be changed in response to conditions observed during operations.

XIV. References

Brown and Caldwell, Inc., 2018. *PTF Mine Block Ambient Groundwater Concentrations and Initial Discharge Characterization of the Underground Workings*. August.

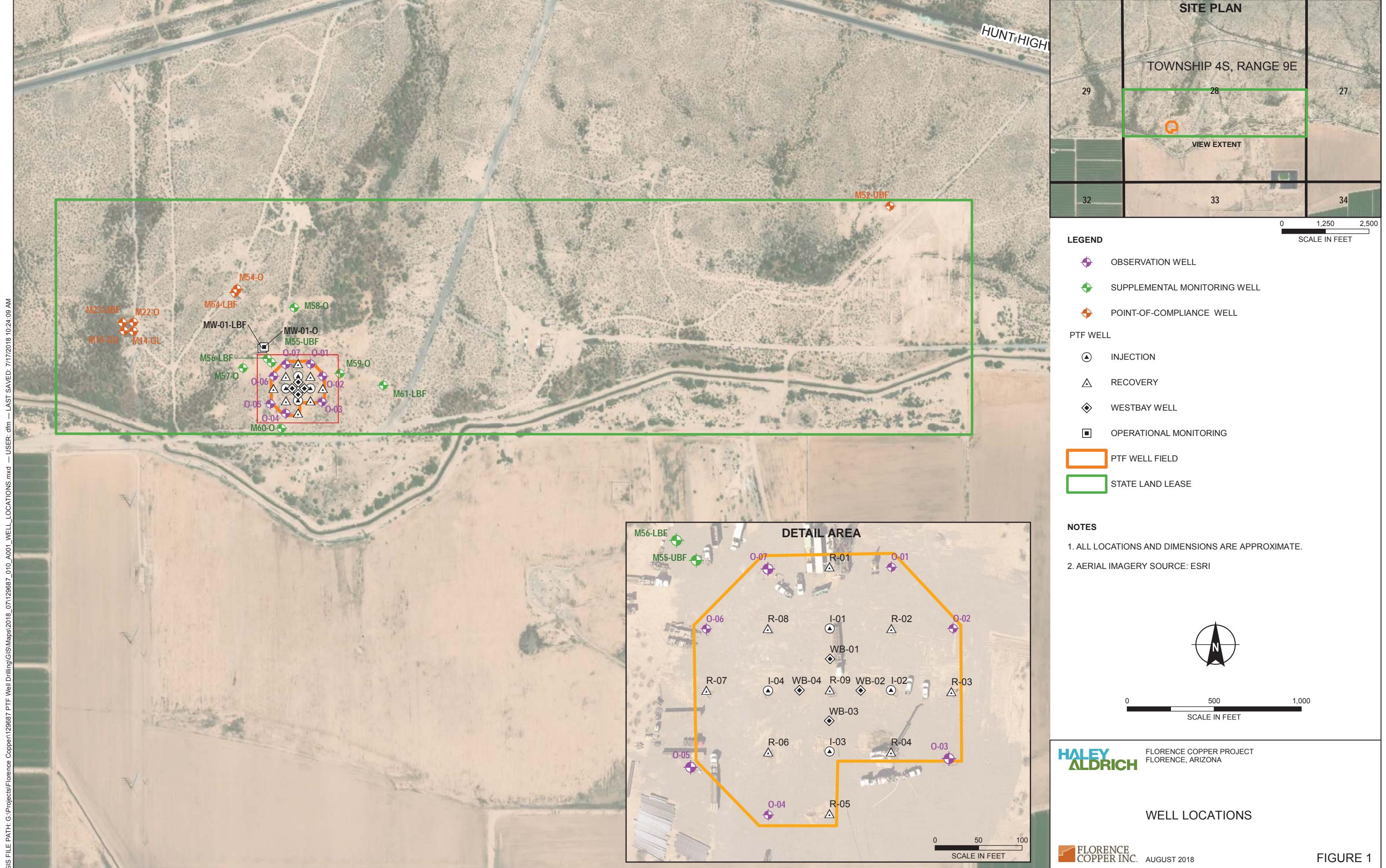
Daniel B. Stephens, Inc., 2014. *Geochemical Evaluation to Forecast Composition of Process Solutions for In-Situ Copper Recovery Pilot Test Facility at Florence Copper, Florence Arizona*. May.

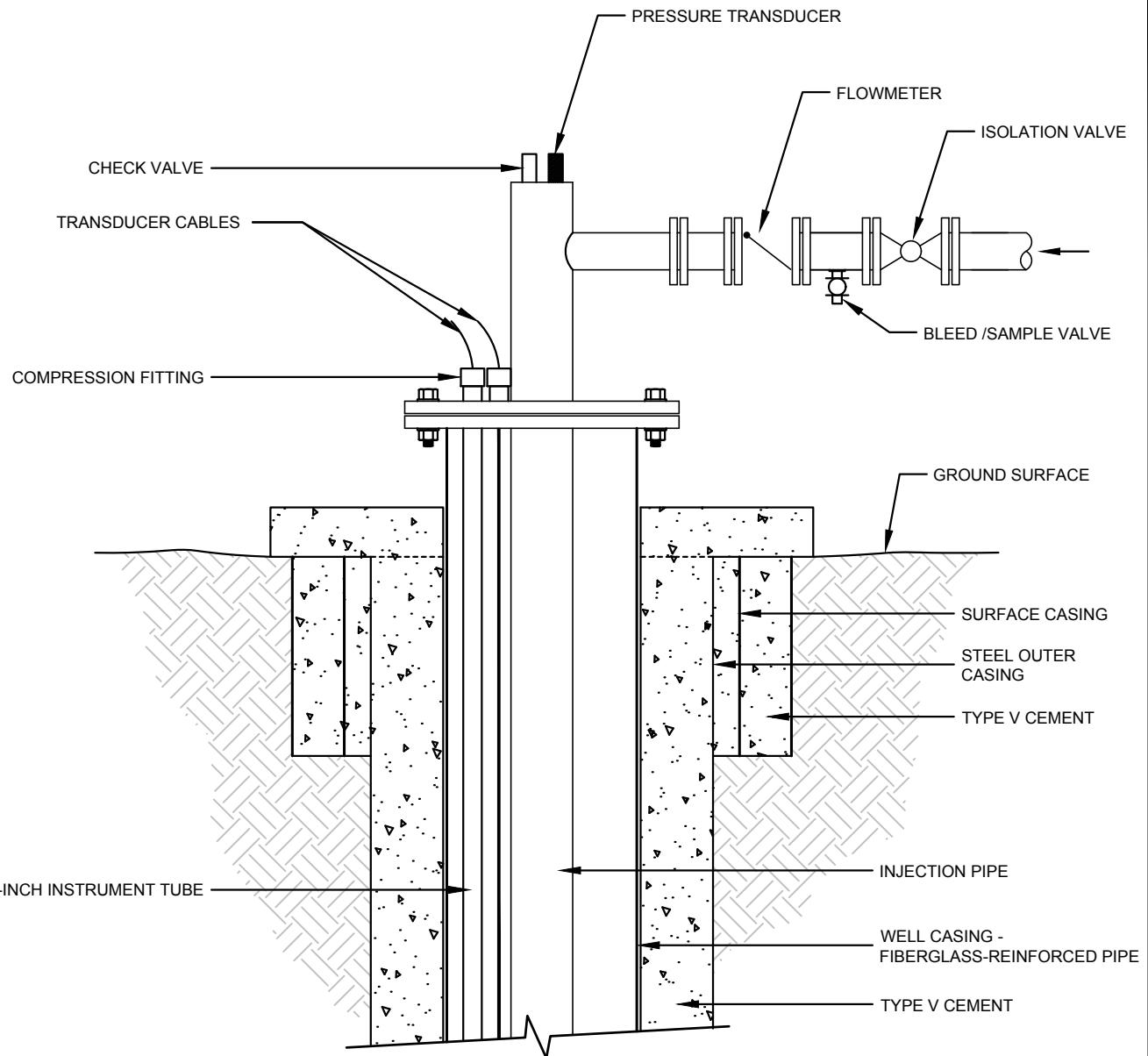
Haley & Aldrich, Inc., 2017. *Well Specification: Drilling, Installation, and Testing of Class III Injection and Recovery Wells, Production Test Facility, Florence, Arizona*. Revised September 2017.

Enclosures:

- Figure 1 – Well Locations
- Figure 2 – Injection Well Head Detail
- Figure 3 – Geophysical Data and Lithologic Log
- Figure 4 – I-02 As-Built Diagram
- Appendix A – Arizona Department of Water Resources Well Registry Report
- Appendix B – Lithologic Log
- Appendix C – Chemical Characteristics of Formation Water
- Appendix D – Well Completion Documentation
- Appendix E – Geophysical Logs
- Appendix F – SAPT Documentation
- Appendix G – Cement Bond Log Summary
- Appendix H – Well Development Field Forms
- Appendix I – Well Video Log and Gyroscopic Survey Reports

FIGURES

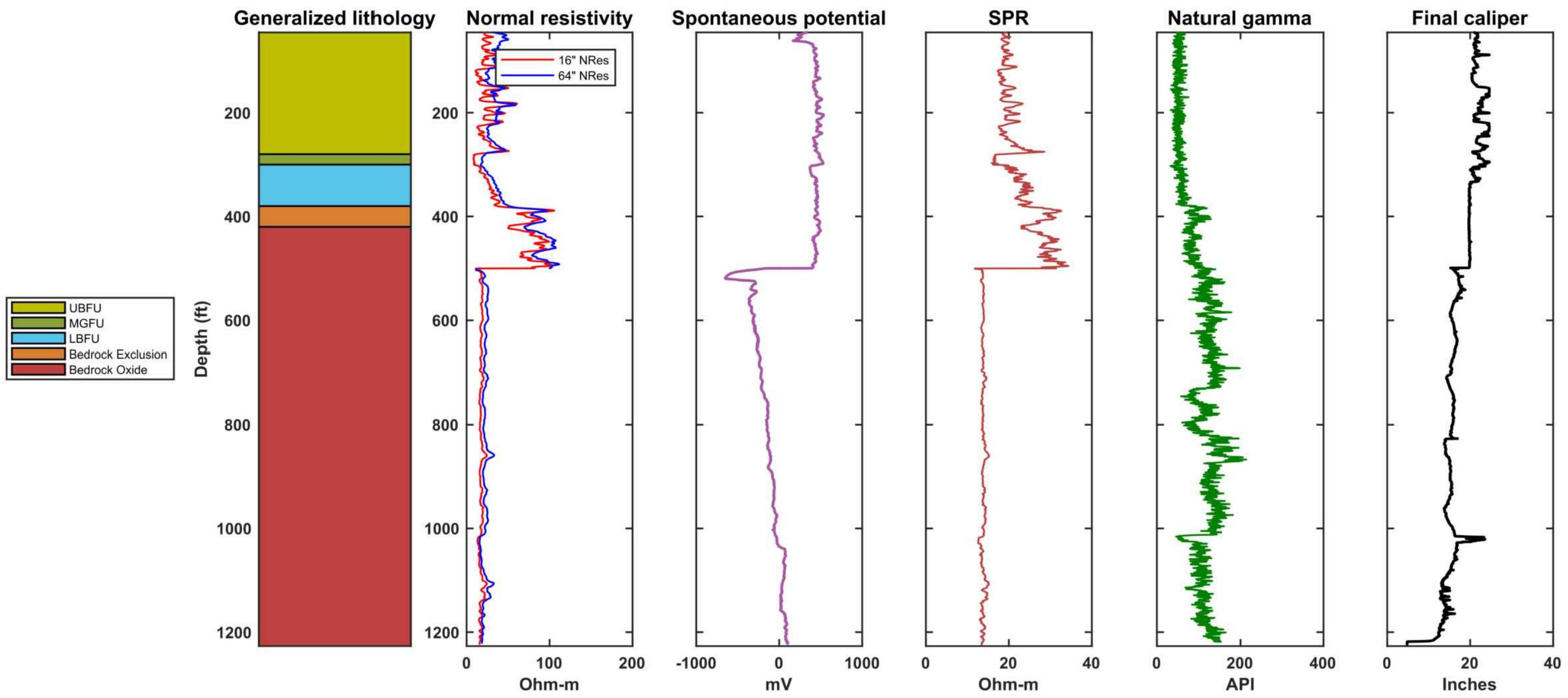




HALEY
ALDRICH

PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

INJECTION WELL HEAD DETAIL



**HALEY
ALDRICH**

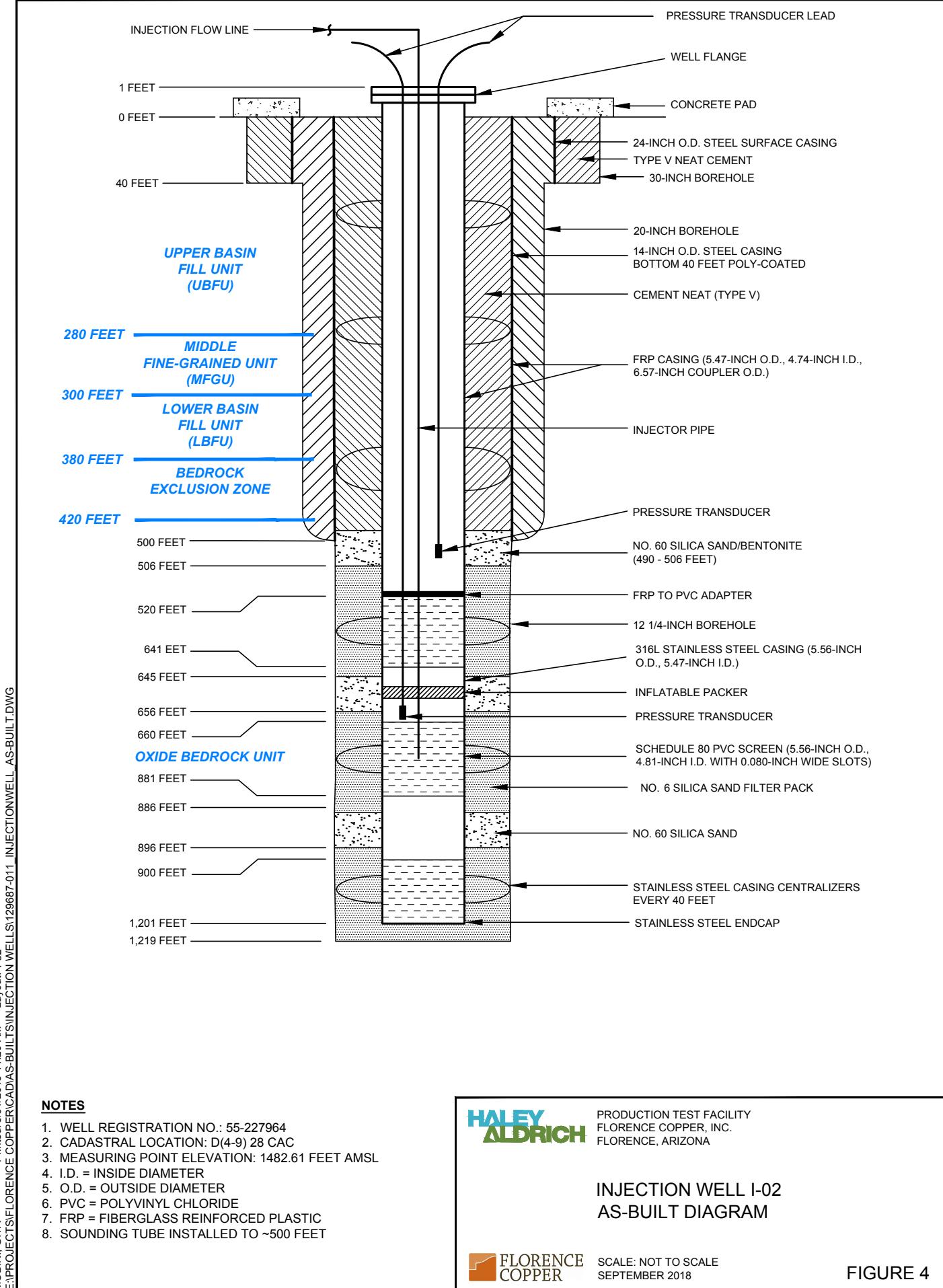
PRODUCTION TEST FACILITY
FLORENCE COPPER, INC.
FLORENCE, ARIZONA

INJECTION WELL I-02
GEOPHYSICAL DATA AND
LITHOLOGIC LOG

**FLORENCE
COPPER**

SCALE: AS SHOWN
SEPTEMBER 2018

FIGURE 3



APPENDIX A

Arizona Department of Water Resources Well Registry Report

Run Date: 11/08/2017

AZ DEPARTMENT OF WATER RESOURCES

WELL REGISTRY REPORT - WELLS55

Location D 4.0 9.0 28 C A C Well Reg.No 55 - 227964 AMA PINAL AMA

Registered Name FLORENCE COPPER INC File Type NEW WELLS (INTENTS OR APPLICATIONS)
1575 W HUNT HWY Application/Issue Date 10/17/2017

FLORENCE AZ 85132

Owner	OWNER	Well Type	ENV - INJECTION
Driller No.	816	SubBasin	ELOY
Driller Name	HYDRO RESOURCES - ROCKY MOUNTAIN, INC.	Watershed	UPPER GILA RIVER
Driller Phone	303-857-7540	Registered Water Uses	INDUSTRIAL
County	PINAL	Registered Well Uses	RECHARGE
Parcel No.	200-31-020	Discharge Method	NO DISCHARGE METHOD LISTED
Intended Capacity GPM	0.00	Power	NO POWER CODE LISTED

Well Depth	0.00	Case Diam	0.00	Tested Cap	0.00
Pump Cap.	0.00	Case Depth	0.00	CRT	
Draw Down	0.00	Water Level	0.00	Log	
		Acres Irrig	0.00	Finish	NO CASING CODE LISTED

Contamination Site: NO - NOT IN ANY REMEDIAL ACTION SITE

Tribe: Not in a tribal zone

Comments

Current Action

11/7/2017 555 DRILLER & OWNER PACKETS MAILED
Action Comment: JRN

Action History

11/7/2017 550 DRILLING AUTHORITY ISSUED
Action Comment: JRN
10/17/2017 310 NOI RCVD TO DEEP/MOD/REPL A NON-EXEMPT WELL (S.T. PRE-CODE, 59)
Action Comment: JRN



DOUGLAS A. DUCEY
Governor

THOMAS BUSCHATZKE
Director

ARIZONA DEPARTMENT of WATER RESOURCES
1110 West Washington Street, Suite 310
Phoenix, Arizona 85007
602.771.8500
azwater.gov

November 7, 2017

Ian Ream
Florence Copper, Inc.
1575 W. Hunt Hwy
Florence, AZ 85132

RE: Notice of Intention to Drill a Non-Exempt Well Pursuant to a Non-General Industrial Use Permit
Permit No. 59-562120.0005, Well Registration No. 55-227964;
File No. D(4-9)28 CAC

Dear Mr. Ream:

The above-referenced Notice of Intention to Drill a Non-Exempt Well Pursuant to a Non-General Industrial Use Permit in an Active Management Area (AMA) has been approved. A copy of the Notice is enclosed for your records. The drilling card for the modification of the above referenced well has been forwarded to your well driller.

In the event that the location of the proposed well changes, you must notify the Department of Water Resources of the change in writing. A drill card with the correct proposed well location must be in possession of the driller before drilling may commence. If the proposed new well is to be more than 660 feet from the well that it is replacing, then you may be required to obtain a well permit.

Within 30 days of completion of the well, the well driller is required to furnish this Department with a complete and accurate log of the well. In addition, the well owner is required to submit the enclosed Completion Report within 30 days of installation of pump equipment.

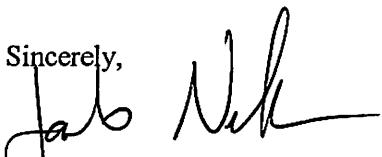
Pursuant to the provisions of A.R.S. § 45-604, any person withdrawing groundwater from a well is required to use a water measuring device to record rates of withdrawal in order to provide or allow the computation of an annual volume of pumpage from the well. The total volume of pumpage from the well which is being replaced and the completed new well shall be reported on your Annual Water Withdrawal and Use Report for calendar year 2017. Subsequent annual reporting periods shall be from January 1 through December 31.

The Department has issued the authorization to drill this well pursuant to A.R.S. §§ 45-596 and 45-597 of the Groundwater Code. The legal nature of the water withdrawn from the well may be the subject of court action in the future as part of a determination of surface water rights in your area. If there are court proceedings that could affect your well, you will be notified and be given the opportunity to participate.

Under A.R.S. § 45-593, the person to whom a well is registered must notify the Department of a change in ownership, physical characteristics or any other data about the well in order to keep the well registration records current and accurate. Forms may be obtained by contacting the Department or online at <http://www.azwater.gov>.

If you have any questions regarding your permit or require any administrative corrections, please the Groundwater Permitting and Wells Unit at 602-771-8527.

Sincerely,



Jacob Nelson
Groundwater Permitting and Wells Unit

Enclosures

**ARIZONA DEPARTMENT OF WATER RESOURCES
WATER MANAGEMENT DIVISION
1110 West Washington Street, Suite 310, Phoenix, AZ 85007**

THIS AUTHORIZATION SHALL BE IN THE POSSESSION OF THE DRILLER DURING ALL DRILL OPERATIONS

WELL REGISTRATION NO: 55-227964

PERMIT NO.: 59-562120.0005

AUTHORIZED DRILLER: Hydro Resources

LICENSE NO.: 816

A PERMIT TO DRILL A NON-EXEMPT WELL INSIDE THE PINAL ACTIVE MANAGEMENT AREA HAS BEEN GRANTED TO:

WELL OWNER: Florence Copper

1575 W. Hunt Highway

Florence, AZ 85132

The well(s) is/are to be located in the:

SW ¼ of the NE ¼ of the SW ¼ of Section 28 Township 4 South, Range 9 East

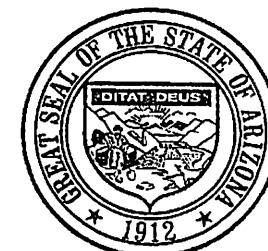
No. of well(s) in this project: 1

THIS AUTHORIZATION EXPIRES AT MIDNIGHT ON THE 16th DAY OF October 2018

Shelly Mirella

GROUNDWATER PERMITTING AND WELLS

**THE DRILLER MUST FILE A LOG OF THE WELL
WITHIN 30 DAYS OF COMPLETION OF DRILLING**





Memorandum

To: Jacob Nelson, Groundwater Permitting and Wells
From: Phil Whitmore, Groundwater Permitting and Wells *PHW*
CC: Jeff Tannler, Statewide AMA Director
Date: 10/24/2017
Subject: Review of Application for a Permit to Drill or Operate Four Non-exempt Wells
within an Active Management Area
59-562120 55-227963-6 D(4-9)28CAC & CBD
Florence Copper, Inc.

ADWR has reviewed the above-referenced applications for four (4) permits to drill and operate non-exempt wells in the Pinal AMA. This hydrologist review is limited to conformance with well construction standards only.

The applicant proposes to inject 96.8 acre-feet per year from 4 new wells and add them to the applicant's Mineral Extraction Withdrawal permit (59-562120.0005).

Well Construction

The applicant proposes that all four (4) wells will be drilled and constructed in the same manner and drill depths. Each well will be 1210 feet deep with three (3) 200-foot screen intervals all open in the bedrock aquifer only. They will have 5-inch diameter inner casing constructed with PVC and include elements to reduce chemical corrosion.

The applications each included proposed well construction diagrams indicating that the outer annulus of the wells will be sealed from the surface to 20 feet below land surface and an inner annulus will be sealed to 490 below land surface. The estimated contact of the lower basin fill unit and the crystalline bedrock is approximately 490 feet deep.

The well diagrams did not indicate the height of well stick up and the applicant did not include a request for variance. However, if stick up is to be less than 1 foot above land surface a request for variance should be submitted to comply with Arizona Administrative Code R12-15-820.

Conclusion

We recommend issuing a permit to drill and operate all four (4) non-exempt wells in the proposed location, at the volume and well construction specifications stated in the application.



Letter of Transmittal

Haley & Aldrich, Inc.
One Arizona Center
400 E. Van Buren St., Suite 545
Phoenix, AZ 85004

Date 16 October 2017

File Number 129687

From Lauren Candreva

To Arizona Department of Water Resources
 1110 W. Washington
 Suite 310
 Phoenix, Arizona 85007

Attention Groundwater and Well Permitting Section

Subject Florence Copper, Inc.

Copies	Date	Description
4	October 2017	Notice of Intent to Install a New Well

Transmitted via First class mail Overnight express Hand delivery Other

Remarks

ARIZONA DEPARTMENT OF WATER RESOURCES
GROUNDWATER PERMITTING AND WELLS UNIT
MAIL TO: P.O. BOX 36020, PHOENIX, ARIZONA 85067-6020
1110 W. Washington St. Suite 310, Phoenix, Arizona 85007-2952
Phone (602) 771-8527 Fax (602) 771-8590

**NOTICE OF INTENTION TO DRILL A NON-EXEMPT WELL PURSUANT TO A GROUNDWATER
WITHDRAWAL PERMIT (OTHER THAN A GENERAL INDUSTRIAL USE PERMIT)
IN AN ACTIVE MANAGEMENT AREA**

PLEASE READ GENERAL INSTRUCTIONS AND CONDITIONS ON REVERSE SIDE OF THIS FORM BEFORE COMPLETING.

Section § 45-598, Arizona Revised Statutes provides: In an Active Management Area, prior to drilling a well, a person entitled to withdraw groundwater shall file a Notice of Intention to Drill with the Department. Pursuant to A.R.S. § 45-596 and A.A.C. R12-15-104, the filing fee for this application is \$150.00.

1. WELL/LAND LOCATION:

4S	N/S	9E	E/W	28	
Township		Range		Section	
SW	1/4	NE	1/4	SW	1/4
10 Acre		40 Acre		160 Acre	

2. POSITION LOCATION OF THE WELL:

Latitude 33 ° 3' 0.69" N

Longitude 111 ° 26' 3.87" W

3. COUNTY Pinal

4. APPLICANT

Florence Copper, Inc.

Name

1575 W Hunt Hwy

Mailing Address

Florence AZ 85132

City

State

Zip

Telephone No. 520-374-3984

5. OWNER OF THE LAND OF WELLSITE:

AZ State Land (Mineral Lease #11-026500)

Name

1616 W Adams Street

Mailing Address

Phoenix AZ 85007

City

State

Zip

Telephone No. 602-542-4631

6. THIS NOTICE IS FILED BY:

Check one: Owner Lessee

Ian Ream

Name

1575 W Hunt Hwy

Mailing Address

Florence AZ 85132

City

State

Zip

- 15. Attach a detailed construction diagram of the proposed well design. The diagram should provide verification of consistency with minimum construction requirements. Specifically, the diagram should include an indication of the perforated interval location(s) in relationship to the expected water level; the depth and thickness of the surface seal, and grouting material used; whether the surface or conductor casing will extend above grade; and vault details, if specified.**

I state that this Notice is filed in compliance with Rules A.A.C. R12-15-809 and R12-15-816(F), and is complete and correct to the best of my knowledge and belief, and that I understand the conditions set forth on the reverse side of this form.

Ian Ream
Type or Print Name and

Signature

Land Owner Lessee of well site

Title

Date

7. DESCRIPTION OF THE PROPOSED WELL:

Diameter 5 Inches

Depth 1200 Feet

Type of Casing Steel/FRP/PVC

8. ESTIMATE OF TOTAL ANNUAL PUMPAGE:

-96.8 (INJ) Acre-feet per Year

9. PRINCIPAL USE OF WATER (be specific):

Mineral Extraction

10. OTHER USES INTENDED (be specific):

None

11. CONSTRUCTION WILL START:

September 2017
Month Year

12. CLAIM OF ENTITLEMENT TO WITHDRAW GROUNDWATER:

Permit 59- 562120.0005

13. DRILLING FIRM:

HydroResources

Name

13027 County Rd 18, Unit C

Mailing Address

Fort Lupton CO 80621

City State Zip

303-857-7540

Telephone No.

816

DWR License Number

A-4

ROC License Category

- 14. Is the proposed well within 100 feet of a septic tank system, sewage area, landfill, hazardous waste facility or storage area of hazardous material or a petroleum storage area and tank? Yes No**

FOR DEPARTMENT USE ONLY

File No. 11(4-9)26 CAC

Filed 11/7/17 By JRN

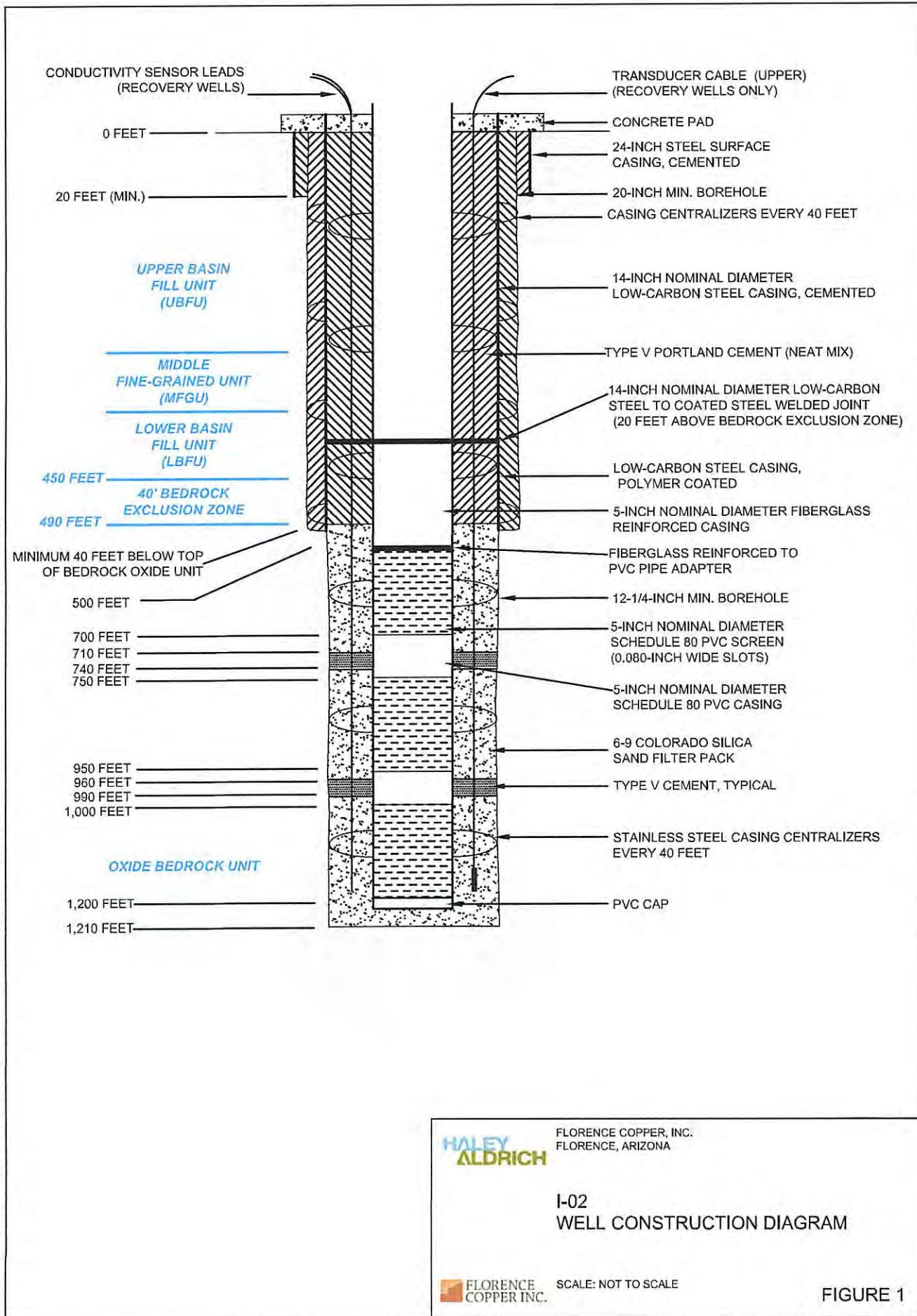
Input 11/7/17 By JRN

DUPLICATE

Mailed 11/7/17 By JRN

Registration 55- 227964

AMA/INA PINAL



ARIZONA DEPARTMENT OF WATER RESOURCES

GROUNDWATER PERMITTING AND WELLS UNIT

1110 W. Washington St. Suite 310, Phoenix, Arizona 85007-2952

Phone (602) 771-8585 Fax (602) 771-8688

WELL CONSTRUCTION SUPPLEMENT (form DWR 55-90)

Well Registration Number 55-227964

1. Well Location:

SW $\frac{1}{4}$ of the NE $\frac{1}{4}$ of the SW $\frac{1}{4}$, Sec. 28 Township 4S Range 9E.
10AC 40AC 160AC

2. Position Location of the Well:

Latitude 33 ° 3 ' 0.69 " Longitude 111 ° 26 ' 3.87 "

Datum: NAD 83 • NAD 27 • Other: _____

3. County PINAL

4. Date construction to start: SEPTEMBER 2017

5. Time period well will remain in use: 5 YEARS

6. Is pump equipment to be installed? NO If so, design pump capacity: - 60 (INJ) GPM.

7. Well construction plan:

a. Drilling method (mud rotary, hollow-stem auger, etc.) MUD ROTARY

b. Borehole diameters 30 inches from 0 feet to 40 feet.
20 inches from 40 feet to 490 feet.

12.25 inches from 490 feet to 1210 feet.

c. Casing materials STEEL/FIBERGLASS REINFORCED PLASTIC/PVC

d. Method of well development (bail, air lift, surge, etc.) AIRLIFT, SURGE

e. Will surface or conductor casing extend above grade? NO

8. Include a detailed construction diagram of the proposed well design. The diagram should verify consistency with minimum construction requirements specified in the Department's well construction rules found in Arizona Administrative Code (A.A.C.) R12-15-801 et seq. Specifically, the diagram should include borehole diameters; casing materials and diameters; perforation intervals; the expected water level; depth and thickness of the surface seal; proposed grouting materials; and the length that the surface or conductor casing will extend above grade, or vault details, if specified.

Pursuant to Arizona Revised Statutes (A.R.S.) § 45-594.B, all well construction, replacement, deepening and abandonment operations shall comply with the rules adopted pursuant to this section. Therefore, any existing well that is deepened or modified must be brought into compliance with minimum well construction standards specified above, if not already in compliance.

9. Proposed materials and method of abandonment if well is to be abandoned after project is completed (Minimum requirements per A.A.C. R12-15-816):

10. Is the proposed wellsite within 100 feet of a septic tank system, sewage disposal area, landfill, hazardous waste facility, storage area of hazardous material, or petroleum storage area or tank? Yes No

11. Is this well to monitor existing contamination? Yes No

Potential contamination? Yes No If yes, please provide explanation: _____

12. Name of Consulting firm, if any: HALEY & ALDRICH, INC.

<u>400 E VAN BUREN STREET SUITE 545</u>	<u>PHOENIX</u>	<u>AZ</u>	<u>85004</u>
Address	City	State	Zip

Contact Person: LAUREN CANDREVA **Telephone Number:** 602-760-2429

13. Drilling firm HYDRORESOURCES

DWR License Number: 816 ROC License Category: A-4

14. Special construction standards, if any, required pursuant to A.A.C. R12-15-821: _____

I (we), _____ hereby affirm that all information provided in this
(print name) application is true and correct to the best of my/our
knowledge and belief.

Signature of Applicant



Date 9-29-2017

Transaction Receipt - Success

Arizona Water Resources
Arizona Water Resources
MID:347501639533
1700 W Washington St
Phoenix , AZ 85012
602-771-8454

10/17/2017 11:46AM
Remittance ID
Arizona10171714444278Nel
Transaction ID:
193090775

LAUREN A. CNADREVA
209 S. Marin Dr.
GILBERT, Arizona 85296
United States
Visa - 7664
Approval Code: 09392C

Sale
Amount: \$600.00

55-227963-...966
N/A
Time Tracking
0
jnelson@azwater.gov

Cardmember acknowledges
receipt of goods and/or
services in the amount of
the total shown hereon and
agrees to perform the
obligations set forth by the
cardmember's agreement with
the issuer.

Signature _____
[click here to continue.](#)

Printed: 10/17/2017 11:58:07 AM

Arizona Department of Water Resources

1110 West Washington Street, Suite 310
Phoenix AZ 85007

Customer:

LAUREN CANDREVA
209 S. MARIN DR.
GILBERT, AZ 85296

Receipt #: 18-54549
Office: MAIN OFFICE
Receipt Date: 10/17/2017
Sale Type: IN_PERSON
Cashier: WRJRN

Item No.	Function Code	AOBJ	Description	Ref ID	Qty	Unit Price	Ext Price
67488	122221	4439-TT	Notice of intention to drill a well other than a well described in subsection (A)(1)(h) of this Section	227964	1	150.00	150.00
RECEIPT TOTAL:							150.00

Payment type: CREDIT CARD

Amount Paid: \$150.00

Payment Received Date: 10/17/2017

Authorization 193090775

Notes: FROM TTA.

APPENDIX B
Lithologic Log

LITHOLOGIC LOG							I-02
Project Production Test Facility, Florence, Arizona Client Florence Copper, Inc. Contractor Cascade Drilling LLC							File No. 129687 Sheet No. 1 of 15 Cadastral Location D (4-9) 28 CAC
Drilling Method Reverse Rotary			Land Surface Elevation 1479.61 feet, amsl			Start 12 November 2017	
Borehole Diameter(s) 30/20/12.25 in.			Datum State Plane NAD 83				Finish 19 February 2018
Rig Make & Model Midway 3500			Location N 746,132 E 847,765				H&A Rep. S. Kaney & C. Giusti
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION			COMMENTS
0		SM		SILTY SAND with GRAVEL (0-6 feet) Primarily fine to coarse sand with ~25% fines and ~20% gravel up to 100mm. Sand and gravel is subangular to subrounded. Fines are nonplastic, no toughness, low dry strength, (7.5YR 4/4), and			
5				WELL GRADED SAND with SILT (6-29 feet) Primarily fine to coarse sand with ~10% fines and ~15% gravel up to 160mm. Sand is subangular to subrounded and gravel is subangular to rounded. Fines are nonplastic, no toughness, low d			
10		SW-SM	6				Well Registry ID: 55-227964 Surface Completion: Bolted Sealed Well Flange Well casing stickup: 1.40 feet als COLOR IDENTIFICATION MADE WITH WET SAMPLES USING MUNSELL CHART
15							
20							
25							
30		SW	29	WELL GRADED SAND with GRAVEL (29-40 feet) Primarily fine to coarse sand with ~5% fines and ~20% gravel up to 160mm. Sand and gravel is subangular to subrounded. Fines are nonplastic, no toughness, no dry strength, (7.5YR 4/4)			
35							
40		SM	40	SILTY SAND (40-45 feet) Primarily fine to coarse sand with ~25% fines and trace gravel up to 8mm. Sand is subrounded to angular and gravel is subrounded. Fines have low plasticity, low toughness, low dry strength, are red-br			
45							
50		SW	45	WELL GRADED SAND (45-55 feet) Primarily fine to coarse sand with ~5% fines and ~5% gravel up to 12mm. Sand is angular to subrounded and gravel is subrounded to subangular. Fines are nonplastic, have no toughness, no dry stren			
55							
60		SC	55	CLAYEY SAND (55-75 feet) Primarily fine to coarse sand with ~30% fines and ~5% gravel up to 14mm. Sand is subrounded to angular and gravel is subrounded to subangular. Fines have high plasticity, medium toughness, high dry stt			
65							
70							
75							
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).							I-02

LITHOLOGIC LOG						I-02 File No. 129687 Sheet No. 2 of 15
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION		
-75	SW-SM	75	75	WELL GRADED SAND with SILT (75-90 feet) Primarily fine to coarse sand with ~10% fines and ~5% gravel up to 16mm. Sand is subrounded to angular and gravel is subangular to subrounded. Fines have low plasticity, low toughness,		
-80						
-85						
-90	SC	90	90	CLAYEY SAND (90-110 feet) Primarily fine to coarse sand with ~25% fines and trace gravel up to 6mm. Sand is subangular to subrounded and gravel is subrounded. Fines have high plasticity, medium toughness, medium dry strength,		
-95						
-100						
-105						
-110	SW-SC	110	110	WELL GRADED SAND with CLAY (110-120 feet) Primarily fine to coarse sand with ~10% fines and ~5% gravel up to 11mm. Sand is subrounded to angular and gravel is subrounded to subangular. Fines have medium plasticity, low toughn		
-115						
-120	CH	120	120	FAT CLAY with SAND (120-150 feet) Primarily fines with ~15% sand and ~5% gravel up to 14mm. Sand is subrounded to angular and gravel is subangular to subrounded. Fines have high plasticity, medium toughness, high dry strength		
-125						
-130						
-135						
-140						
-145						
-150	SP-SC	150	150	POORLY GRADED SAND with CLAY (150-160 feet) Primarily coarse sand with ~10% fines and ~10% gravel up to 11mm. Sand and gravel is subrounded to subangular. Fines have medium plasticity, low toughness, medium dry strength, are		
-155						
-160	CH	160	160	SANDY FAT CLAY (160-165 feet) Primarily fines with ~40% sands and ~5% gravel		
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).						I-02

LITHOLOGIC LOG					I-02 File No. 129687 Sheet No. 3 of 15
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
-1315			165	up to 14mm. Sand and gravel is subrounded to subangular. Fines have high plasticity, medium toughness, high dry strength, are red-brown (7.5YR 5/4)	
-165	SP-SM		165	POORLY GRADED SAND with SILT and GRAVEL (165-190 feet) Primarily coarse to fine sand with ~10% fines and ~20% gravel up to 14mm. Sand and gravel is subrounded to subangular. Fines have low plasticity, low toughness, low dry s	
-1310					
-170					
-1305					
-180					
-1295					
-190	SW-SC		190	POORLY GRADED SAND with CLAY (190-205 feet) Primarily coarse to fine sand with ~10% fines and ~10% gravel up to 19mm. Sand and gravel is subrounded to subangular. Fines have medium plasticity, low toughness, medium dry streng	
-1285					
-200					
-1275	SW-SM		205	WELL GRADED SAND with SILT (205-225 feet) Primarily fine to coarse sand with ~10% fines and ~5% gravel up to 7mm. Sand and gravel is subrounded to subangular. Fines have low plasticity, low toughness, medium dry strength, are	
-210					
-1270					
-1265					
-220					
-1255	SC		225	CLAYEY SAND (225-245 feet) Primarily fine to coarse sand with ~30% fines and ~5% gravel up to 9mm. Sand and gravel is subangular to subrounded. Fines have medium plasticity, medium toughness, high dry strength, are brown (7.5	
-230					
-1245					
-240					
-1235	SW-SC		245	WELL GRADED SAND with CLAY (245-260 feet) Primarily fine to coarse sand with ~10% fines and ~5% gravel up to 11mm. Sand and gravel is subangular to subrounded. Fines have medium plasticity, medium toughness, medium dry streng	
-245					

LITHOLOGIC LOG					I-02 File No. 129687 Sheet No. 4 of 15
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
-1230					
-250					
-255					
-225					
-255					
-220					
-260	CH		260	FAT CLAY with SAND (260-270 feet) Primarily fines with ~15% sands and trace gravel up to 6mm. Sand is subangular to subrounded. Fines have high plasticity, medium toughness, high dry strength, are brown (7.5YR 5/4), and stron	
-265					
-215					
-270	SC		270	SAND CLAYEY (270-280 feet) Primarily fine to medium sand with ~25% fines and ~5% gravel up to 9mm. Sand and gravel is subangular to subrounded. Fines have medium plasticity, medium toughness, medium dry strength, are brown (7	
-275					
-205					
-280	SW-SC		280	WELL GRADED SAND with CLAY (280-300 feet) Primarily fine to medium sand with ~10% fines and ~5% gravel up to 11mm. Sand and gravel is subangular to subrounded. Fines have high plasticity, medium toughness, medium dry strength	
-285					
-195					
-290					
-185					
-300	SC		300	CLAYEY SAND (325-345 feet) Primarily fine to coarse sand with ~20% fines and ~5% gravel up to 11mm. Sand and gravel is subangular to subrounded. Fines have high plasticity, medium toughness, high dry strength, are brown (7.5Y	
-305					
-175					
-310					
-165					
-320					
-160					
-325					
-155					
-330					
-150					
-335					
-145					
NOTE: Lithologic descriptions, group symbols, and grain-size determinations based on the USCS visual-manual method (Haley & Aldrich OP2001A - Field Practice for Soil Identification and Description).					I-02

LITHOLOGIC LOG					I-02 File No. 129687 Sheet No. 5 of 15
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
-340	-1140				
-345	-1135	SP-SC	345	POORLY GRADED SAND with CLAY and GRAVEL (345-380 feet) Primarily coarse to fine sand with ~30% fines and ~30% gravel up to 24mm. Sand is subrounded to angular and gravel is subangular to subrounded. Fines have medium plasticity	
-350	-1130				
-355	-1125				
-360	-1120				
-365	-1115				
-370	-1110				
-375	-1105				
-380	-1100		380	QUARTZ MONZONITE (380-520 feet) Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximately 5%. Cu minerals present at 420'.	
-385	-1095				
-390	-1090				
-395	-1085				
-400	-1080				
-405	-1075				
-410	-1070				
-415	-1065				
-420	-1060				
			422		

HALEY ALDRICH LITHOLOGIC LOG					I-02 File No. 129687 Sheet No. 6 of 15			
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)					
VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION								
<u>QUARTZ MONZONITE (380-520 feet) Continued</u>								
-1055								
-1050								
-1045								
-1040								
-1035								
-1030								
-1025								
-1020								
-1015								
-1010								
-1005								
-1000								
-995								
-990								
-985								
-980								
-975								

**HALEY
ALDRICH****LITHOLOGIC LOG****I-02**File No. 129687
Sheet No. 7 of 15

Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
-510					
-515					
-515	965				
-515					
-520	960				
-520					
-525					
-525	955				
-525					
-530					
-530	950				
-530					
-535					
-535	945				
-535					
-540					
-540	940				
-540					
-545					
-545	935				
-545					
-550					
-550	930				
-550					
-555					
-555	925				
-555					
-560					
-560	920				
-560					
-565					
-565	915				
-565					
-570					
-570	910				
-570					
-575					
-575	905				
-575					
-580					
-580	900				
-580					
-585					
-585	895				
-585					
-590					
-590	890				
-590					
-595					
-595	885				
-595					

HALEY ALDRICH LITHOLOGIC LOG					I-02 File No. 129687 Sheet No. 8 of 15
VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION					
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)		
596	QUARTZ MONZONITE (520-730 feet) Continued				
880					
605					
875					
610					
870					
615					
865					
620					
860					
625					
855					
630					
850					
635					
845					
640					
840					
645					
835					
650					
830					
655					
825					
660					
820					
665					
815					
670					
810					
675					
805					
680					

LITHOLOGIC LOG					I-02 File No. 129687 Sheet No. 9 of 15
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
685	683			<u>QUARTZ MONZONITE (520-730 feet)</u> Continued	
690					
695					
700					
705					
710					
715					
720					
725					
730	730			<u>DIABASE (730-760 feet)</u> Dark gray to black igneous rock.	
735					
740					
745					
750					
755					
760	760			<u>QUARTZ MONZONITE (760-860 feet)</u> Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximatley 5%.	
765					
770					
775					
780					
785					
790					
795					
800					

HALEY ALDRICH LITHOLOGIC LOG					I-02 File No. 129687 Sheet No. 10 of 15
VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION					
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)		
-710	770			QUARTZ MONZONITE (760-860 feet) Continued	
-770					
-755	705				
-780	700				
-785	695				
-790	690				
-795	685				
-800	680				
-805	675				
-810	670				
-815	665				
-820	660				
-825	655				
-830	650				
-835	645				
-840	640				
-845	635				
-850	630				
-855	625				

LITHOLOGIC LOG					I-02 File No. 129687 Sheet No. 11 of 15
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)	VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION	
620					
860	860			GRANODIORITE (860-875 feet) Contains mostly plagioclase in a gray aphanitic matrix with biotite crystals composing approximately 10%.	
865					
870					
875	875			QUARTZ MONZONITE (875-1220 feet) Consists of quartz at approximately 35%, potassium feldspars at approximately 35%, plagioclase at approximately 25%, and biotite at approximatley 5%.	
605					
600					
595					
590					
585					
580					
575					
570					
565					
560					
555					
550					
545					
540					
943					

HALEY ALDRICH LITHOLOGIC LOG					I-02 File No. 129687 Sheet No. 12 of 15			
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)					
VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION								
QUARTZ MONZONITE (875-1220 feet) Continued								
945								
950								
955								
960								
965								
970								
975								
980								
985								
990								
995								
1000								
1005								
1010								
1015								
1020								
1025								
1030								
1035								
1040								
1045								
1050								
1055								
1060								
1065								
1070								
1075								
1080								
1085								
1090								
1095								
1100								
1105								
1110								
1115								
1120								
1125								
1130								
1135								
1140								
1145								
1150								
1155								
1160								
1165								
1170								
1175								
1180								
1185								
1190								
1195								
1200								
1205								
1210								
1215								
1220								

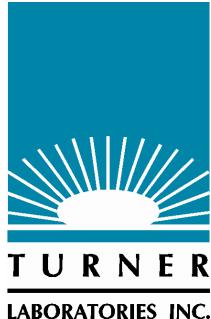
HALEY ALDRICH LITHOLOGIC LOG					I-02 File No. 129687 Sheet No. 13 of 15
VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION					
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)		
1030	1030		<u>QUARTZ MONZONITE (875-1220 feet) Continued</u>		
1035					
1040					
1045					
1050					
1055					
1060					
1065					
1070					
1075					
1080					
1085					
1090					
1095					
1100					
1105					
1110					
1115					

HALEY ALDRICH LITHOLOGIC LOG					I-02 File No. 129687 Sheet No. 14 of 15
VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION					
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)		
1117			QUARTZ MONZONITE (875-1220 feet) Continued		
1120	360				
1125	355				
1130	350				
1135	345				
1140	340				
1145	335				
1150	330				
1155	325				
1160	320				
1165	315				
1170	310				
1175	305				
1180	300				
1185	295				
1190	290				
1195	285				
1200	280				

HALEY ALDRICH LITHOLOGIC LOG					I-02 File No. 129687 Sheet No. 15 of 15
VISUAL-MANUAL IDENTIFICATION AND DESCRIPTION					
Depth (ft)	Elevation	USCS Symbol	Stratum Change Depth (ft)		
1205	275	1204	<u>QUARTZ MONZONITE (875-1220 feet) Continued</u>		
1210	270				
1215	265				
1220	260	1220			Total Borehole Depth: Driller = 1225 feet; Geophysical Logging = 1220 feet

APPENDIX C

Chemical Characteristics of Formation Water



May 23, 2018

Barbara Sylvester
Brown & Caldwell
201 E. Washington Suite 500
Phoenix, AZ 85004

TEL (602) 567-3894
FAX -

RE: PTF

Work Order No.: 18D0619
Order Name: Florence Copper

Dear Barbara Sylvester,

Turner Laboratories, Inc. received 2 sample(s) on 04/25/2018 for the analyses presented in the following report.

All results are intended to be considered in their entirety, and Turner Laboratories, Inc. is not responsible for use of less than the complete report. Results apply only to the samples analyzed. Samples will be disposed of 30 days after issue of our report unless special arrangements are made.

The pages that follow may contain sensitive, privileged or confidential information intended solely for the addressee named above. If you receive this message and are not the agent or employee of the addressee, this communication has been sent in error. Please do not disseminate or copy any of the attached and notify the sender immediately by telephone. Please also return the attached sheet(s) to the sender by mail.

Please call if you have any questions.

Respectfully submitted,

Turner Laboratories, Inc.
ADHS License AZ0066

A handwritten signature in black ink, appearing to read "Kevin Brim".

Kevin Brim
Project Manager

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

Order: Florence Copper

Work Order Sample Summary

Lab Sample ID	Client Sample ID	Matrix	Collection Date/Time
18D0619-01	R-09	Ground Water	04/23/2018 1555
18D0619-02	TB	Ground Water	04/25/2018 0000

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

Case Narrative

The 8015D analysis was performed by TestAmerica Laboratories, Inc. in Phoenix, AZ.

The radiochemistry analysis was performed by Radiation Safety Engineering, Inc. in Chandler, AZ.

D5 Minimum Reporting Limit (MRL) is adjusted due to sample dilution; analyte was non-detect in the sample.

H5 This test is specified to be performed in the field within 15 minutes of sampling; sample was received and analyzed past the regulatory holding time.

M3 The spike recovery value is unusable since the analyte concentration in the sample is disproportionate to the spike level. The associated LCS/LCSD recovery was acceptable.

All soil, sludge, and solid matrix determinations are reported on a wet weight basis unless otherwise noted.

ND Not Detected at or above the PQL

PQL Practical Quantitation Limit

DF Dilution Factor

PRL Project Reporting Limit

Turner Laboratories, Inc.**Date: 05/23/2018**

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-01

Client Sample ID: R-09
Collection Date/Time: 04/23/2018 1555
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
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ICP Dissolved Metals-E 200.7 (4.4)

Calcium	140	4.0	M3	mg/L	1	04/27/2018	1440	05/04/2018	1150	MH
Iron	ND	0.30		mg/L	1	04/27/2018	1440	05/04/2018	1150	MH
Magnesium	27	3.0		mg/L	1	04/27/2018	1440	05/04/2018	1150	MH
Potassium	6.8	5.0		mg/L	1	04/27/2018	1440	05/04/2018	1150	MH
Sodium	170	5.0	M3	mg/L	1	04/27/2018	1440	05/04/2018	1150	MH

ICP/MS Dissolved Metals-E 200.8 (5.4)

Aluminum	ND	0.0800	D5	mg/L	2	04/27/2018	1440	05/07/2018	1139	MH
Antimony	ND	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Arsenic	0.0016	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Barium	0.071	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Beryllium	ND	0.00050	D5	mg/L	2	04/27/2018	1440	05/07/2018	1139	MH
Cadmium	ND	0.00025		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Chromium	0.0051	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Cobalt	ND	0.00025		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Copper	0.011	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Lead	ND	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Manganese	0.0020	0.00025		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Nickel	0.0033	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Selenium	ND	0.0025		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Thallium	ND	0.00050		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH
Zinc	ND	0.040		mg/L	1	04/27/2018	1440	05/07/2018	1133	MH

CVAA Dissolved Mercury-E 245.1

Mercury	ND	0.0010		mg/L	1	04/26/2018	0955	04/26/2018	1639	MH
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pH-E150.1

pH (pH Units)	7.8	H5	-	1	04/26/2018	1615	04/26/2018	1616	AP
Temperature (°C)	22	H5	-	1	04/26/2018	1615	04/26/2018	1616	AP

ICP/MS Total Metals-E200.8 (5.4)

Uranium	0.016	0.00050		mg/L	1	04/27/2018	1230	04/30/2018	1348	MH
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Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-01

Client Sample ID: R-09
Collection Date/Time: 04/23/2018 1555
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Anions by Ion Chromatography-E300.0 (2.1)									
Chloride	310		25		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Fluoride	ND		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrate (As N)	8.8		0.50		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Nitrogen, Nitrite (As N)	ND		0.10		mg/L	1	04/25/2018 1208	04/25/2018 1544	AP
Sulfate	190		130		mg/L	25	04/26/2018 1225	04/26/2018 1415	AP
Cyanide-E335.4									
Cyanide	ND		0.10		mg/L	1	04/26/2018 0845	04/30/2018 1545	AP
Alkalinity-SM2320B									
Alkalinity, Bicarbonate (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Carbonate (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Hydroxide (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Phenolphthalein (As CaCO3)	ND		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Alkalinity, Total (As CaCO3)	150		2.0		mg/L	1	05/03/2018 1030	05/03/2018 1210	EJ
Specific Conductance-SM2510 B									
Conductivity	1700		0.20		μmhos/cm	2	05/09/2018 1315	05/09/2018 1330	AP
Total Dissolved Solids (Residue, Filterable)-SM2540 C									
Total Dissolved Solids (Residue, Filterable)	1000		20		mg/L	1	04/26/2018 0826	05/01/2018 1600	EJ
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 1943	KP
<i>Surr: 4-Bromofluorobenzene</i>	95	70-130		%REC	1	05/07/2018 1824	05/07/2018 1943	KP	
<i>Surr: Dibromofluoromethane</i>	101	70-130		%REC	1	05/07/2018 1824	05/07/2018 1943	KP	
<i>Surr: Toluene-d8</i>	77	70-130		%REC	1	05/07/2018 1824	05/07/2018 1943	KP	

Turner Laboratories, Inc.**Date: 05/23/2018**

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Lab Sample ID: 18D0619-02

Client Sample ID: TB
Collection Date/Time: 04/25/2018 0000
Matrix: Ground Water
Order Name: Florence Copper

Analyses	Result	PRL	PQL	Qual	Units	DF	Prep Date	Analysis Date	Analyst
Volatile Organic Compounds by GC/MS-SW8260B									
Benzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Carbon disulfide	ND		2.0		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Ethylbenzene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Toluene	ND		0.50		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
Xylenes, Total	ND		1.5		ug/L	1	05/07/2018 1824	05/07/2018 2344	KP
<i>Surr: 4-Bromofluorobenzene</i>	101	70-130		%REC	1	05/07/2018 1824	05/07/2018 2344	KP	
<i>Surr: Dibromofluoromethane</i>	110	70-130		%REC	1	05/07/2018 1824	05/07/2018 2344	KP	
<i>Surr: Toluene-d8</i>	103	70-130		%REC	1	05/07/2018 1824	05/07/2018 2344	KP	

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD RPD	RPD Limit Qual	
Batch 1804269 - E 245.1									
Blank (1804269-BLK1) Prepared & Analyzed: 04/26/2018									
Mercury	ND	0.0010	mg/L						
LCS (1804269-BS1) Prepared & Analyzed: 04/26/2018									
Mercury	0.0049	0.0010	mg/L	0.005000	98	85-115			
LCS Dup (1804269-BSD1) Prepared & Analyzed: 04/26/2018									
Mercury	0.0048	0.0010	mg/L	0.005000	95	85-115	2	20	
Matrix Spike (1804269-MS1) Source: 18D0394-01 Prepared & Analyzed: 04/26/2018									
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	97	85-115		
Matrix Spike Dup (1804269-MSD1) Source: 18D0394-01 Prepared & Analyzed: 04/26/2018									
Mercury	0.0050	0.0010	mg/L	0.005000	0.00020	96	85-115	1	20
Batch 1804292 - E200.8 (5.4)									
Blank (1804292-BLK1) Prepared & Analyzed: 04/30/2018									
Uranium	ND	0.00050	mg/L						
LCS (1804292-BS1) Prepared & Analyzed: 04/30/2018									
Uranium	0.046	0.00050	mg/L	0.05000	92	85-115			
LCS Dup (1804292-BSD1) Prepared & Analyzed: 04/30/2018									
Uranium	0.046	0.00050	mg/L	0.05000	92	85-115	0.2	20	
Matrix Spike (1804292-MS1) Source: 18D0614-01 Prepared & Analyzed: 04/30/2018									
Uranium	0.051	0.00050	mg/L	0.05000	0.0015	99	70-130		
Batch 1805051 - E 200.7 (4.4)									
Blank (1805051-BLK1) Prepared & Analyzed: 05/04/2018									
Calcium	ND	4.0	mg/L						
Iron	ND	0.30	mg/L						
Magnesium	ND	3.0	mg/L						
Potassium	ND	5.0	mg/L						
Sodium	ND	5.0	mg/L						
LCS (1805051-BS1) Prepared & Analyzed: 05/04/2018									
Calcium	11	4.0	mg/L	10.00	109	85-115			
Iron	1.0	0.30	mg/L	1.000	104	85-115			
Magnesium	10	3.0	mg/L	10.00	105	85-115			
Potassium	10	5.0	mg/L	10.00	105	85-115			
Sodium	10	5.0	mg/L	10.00	105	85-115			
LCS Dup (1805051-BSD1) Prepared & Analyzed: 05/04/2018									
Calcium	11	4.0	mg/L	10.00	110	85-115	1	20	
Iron	1.0	0.30	mg/L	1.000	105	85-115	0.5	20	
Magnesium	10	3.0	mg/L	10.00	105	85-115	0.06	20	
Potassium	10	5.0	mg/L	10.00	105	85-115	0.05	20	
Sodium	11	5.0	mg/L	10.00	109	85-115	4	20	

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyst	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD RPD	RPD Limit	RPD Qual
Batch 1805051 - E 200.7 (4.4)										
Matrix Spike (1805051-MS1)										
Source: 18D0619-01 Prepared & Analyzed: 05/04/2018										
Calcium	150	4.0	mg/L	10.00	140	59	70-130		M3	
Iron	1.1	0.30	mg/L	1.000	0.028	105	70-130			
Magnesium	38	3.0	mg/L	10.00	27	108	70-130			
Potassium	17	5.0	mg/L	10.00	6.8	105	70-130			
Sodium	170	5.0	mg/L	10.00	170	30	70-130		M3	
Matrix Spike (1805051-MS2)										
Source: 18E0021-01 Prepared & Analyzed: 05/04/2018										
Calcium	64	4.0	mg/L	10.00	54	103	70-130			
Iron	1.0	0.30	mg/L	1.000	0.0060	101	70-130			
Magnesium	21	3.0	mg/L	10.00	11	99	70-130			
Potassium	15	5.0	mg/L	10.00	4.7	104	70-130			
Sodium	99	5.0	mg/L	10.00	90	87	70-130			
Batch 1805069 - E 200.8 (5.4)										
Blank (1805069-BLK1)										
Prepared & Analyzed: 05/07/2018										
Aluminum	ND	0.0400	mg/L							
Antimony	ND	0.00050	mg/L							
Arsenic	ND	0.00050	mg/L							
Barium	ND	0.00050	mg/L							
Beryllium	ND	0.00025	mg/L							
Cadmium	ND	0.00025	mg/L							
Chromium	ND	0.00050	mg/L							
Cobalt	ND	0.00025	mg/L							
Copper	ND	0.00050	mg/L							
Lead	ND	0.00050	mg/L							
Manganese	ND	0.00025	mg/L							
Nickel	ND	0.00050	mg/L							
Selenium	ND	0.0025	mg/L							
Thallium	ND	0.00050	mg/L							
Zinc	ND	0.040	mg/L							
LCS (1805069-BS1)										
Prepared & Analyzed: 05/07/2018										
Aluminum	0.104	0.0400	mg/L	0.1000	104	85-115				
Antimony	0.048	0.00050	mg/L	0.05000	96	85-115				
Arsenic	0.050	0.00050	mg/L	0.05000	100	85-115				
Barium	0.050	0.00050	mg/L	0.05000	100	85-115				
Beryllium	0.049	0.00025	mg/L	0.05000	97	85-115				
Cadmium	0.050	0.00025	mg/L	0.05000	100	85-115				
Chromium	0.051	0.00050	mg/L	0.05000	102	85-115				
Cobalt	0.051	0.00025	mg/L	0.05000	101	85-115				
Copper	0.051	0.00050	mg/L	0.05000	103	85-115				
Lead	0.049	0.00050	mg/L	0.05000	98	85-115				
Manganese	0.050	0.00025	mg/L	0.05000	101	85-115				
Nickel	0.051	0.00050	mg/L	0.05000	102	85-115				
Selenium	0.051	0.0025	mg/L	0.05000	103	85-115				
Thallium	0.050	0.00050	mg/L	0.05000	101	85-115				
Zinc	0.10	0.040	mg/L	0.1000	101	85-115				

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD RPD	RPD Limit	RPD Qual
Batch 1805069 - E 200.8 (5.4)										
LCS Dup (1805069-BSD1)										
Prepared & Analyzed: 05/07/2018										
Aluminum	0.115	0.0400	mg/L	0.1000	115	85-115	10	20		
Antimony	0.048	0.00050	mg/L	0.05000	96	85-115	0.7	20		
Arsenic	0.050	0.00050	mg/L	0.05000	101	85-115	0.8	20		
Barium	0.051	0.00050	mg/L	0.05000	102	85-115	1	20		
Beryllium	0.049	0.00025	mg/L	0.05000	97	85-115	0.2	20		
Cadmium	0.050	0.00025	mg/L	0.05000	100	85-115	0.2	20		
Chromium	0.051	0.00050	mg/L	0.05000	102	85-115	0.4	20		
Cobalt	0.050	0.00025	mg/L	0.05000	101	85-115	0.5	20		
Copper	0.052	0.00050	mg/L	0.05000	105	85-115	2	20		
Lead	0.049	0.00050	mg/L	0.05000	98	85-115	0.1	20		
Manganese	0.050	0.00025	mg/L	0.05000	101	85-115	0.09	20		
Nickel	0.051	0.00050	mg/L	0.05000	103	85-115	0.8	20		
Selenium	0.052	0.0025	mg/L	0.05000	104	85-115	2	20		
Thallium	0.050	0.00050	mg/L	0.05000	101	85-115	0.06	20		
Zinc	0.10	0.040	mg/L	0.1000	104	85-115	3	20		
Matrix Spike (1805069-MS1)										
Source: 18D0693-01										
Prepared & Analyzed: 05/07/2018										
Aluminum	0.239	0.0400	mg/L	0.1000	0.166	74	70-130			
Antimony	0.045	0.00050	mg/L	0.05000	0.00024	90	70-130			
Arsenic	0.056	0.00050	mg/L	0.05000	0.0035	104	70-130			
Barium	0.16	0.00050	mg/L	0.05000	0.12	94	70-130			
Beryllium	0.045	0.00025	mg/L	0.05000	0.000029	90	70-130			
Cadmium	0.047	0.00025	mg/L	0.05000	ND	94	70-130			
Chromium	0.049	0.00050	mg/L	0.05000	0.00052	98	70-130			
Cobalt	0.048	0.00025	mg/L	0.05000	0.00097	95	70-130			
Copper	0.051	0.00050	mg/L	0.05000	0.0020	98	70-130			
Lead	0.047	0.00050	mg/L	0.05000	0.00016	94	70-130			
Manganese	0.054	0.00025	mg/L	0.05000	0.0075	94	70-130			
Nickel	0.049	0.00050	mg/L	0.05000	0.0018	94	70-130			
Selenium	0.057	0.0025	mg/L	0.05000	ND	114	70-130			
Thallium	0.048	0.00050	mg/L	0.05000	0.000038	96	70-130			
Zinc	0.11	0.040	mg/L	0.1000	ND	109	70-130			

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD RPD	RPD Limit	RPD Qual
Batch 1804261 - SM2540 C										
Duplicate (1804261-DUP1) Source: 18D0606-01 Prepared: 04/26/2018 Analyzed: 04/27/2018										
Total Dissolved Solids (Residue, Filterable)										
630 20 mg/L 630 0.3 5										
Duplicate (1804261-DUP2) Source: 18D0606-02 Prepared: 04/26/2018 Analyzed: 04/27/2018										
Total Dissolved Solids (Residue, Filterable)										
610 20 mg/L 620 0.8 5										
Batch 1804268 - E335.4										
Blank (1804268-BLK1) Prepared: 04/26/2018 Analyzed: 04/30/2018										
Cyanide										
ND 0.10 mg/L										
LCS (1804268-BS1) Prepared: 04/26/2018 Analyzed: 04/30/2018										
Cyanide										
2.0 0.10 mg/L 2.000 101 90-110										
LCS Dup (1804268-BSD1) Prepared: 04/26/2018 Analyzed: 04/30/2018										
Cyanide										
2.0 0.10 mg/L 2.000 101 90-110 0.1 20										
Matrix Spike (1804268-MS1) Source: 18D0602-03 Prepared: 04/26/2018 Analyzed: 04/30/2018										
Cyanide										
2.1 0.10 mg/L 2.000 ND 103 90-110										
Matrix Spike Dup (1804268-MSD1) Source: 18D0602-03 Prepared: 04/26/2018 Analyzed: 04/30/2018										
Cyanide										
2.0 0.10 mg/L 2.000 ND 98 90-110 5 20										
Batch 1804272 - E150.1										
Duplicate (1804272-DUP1) Source: 18D0662-02 Prepared & Analyzed: 04/26/2018										
pH (pH Units)										
7.8 - 7.8 0.1 200 H5										
Temperature (°C)										
21 - 21 2 200 H5										
Batch 1805027 - SM2320B										
LCS (1805027-BS1) Prepared & Analyzed: 05/03/2018										
Alkalinity, Total (As CaCO ₃)										
240 2.0 mg/L 250.0 96 90-110										
LCS Dup (1805027-BSD1) Prepared & Analyzed: 05/03/2018										
Alkalinity, Total (As CaCO ₃)										
240 2.0 mg/L 250.0 96 90-110 0 10										
Matrix Spike (1805027-MS1) Source: 18D0606-02 Prepared & Analyzed: 05/03/2018										
Alkalinity, Total (As CaCO ₃)										
370 2.0 mg/L 250.0 130 96 85-115										
Matrix Spike Dup (1805027-MSD1) Source: 18D0606-02 Prepared & Analyzed: 05/03/2018										
Alkalinity, Total (As CaCO ₃)										
370 2.0 mg/L 250.0 130 95 85-115 0.5 10										
Batch 1805103 - SM2510 B										
LCS (1805103-BS1) Prepared & Analyzed: 05/09/2018										
Conductivity										
140 0.10 μmhos/cm 141.2 101 0-200										
LCS Dup (1805103-BSD1) Prepared & Analyzed: 05/09/2018										
Conductivity										
140 0.10 μmhos/cm 141.2 101 0-200 0.7 200										
Duplicate (1805103-DUP1) Source: 18E0192-01 Prepared & Analyzed: 05/09/2018										
Conductivity										
4.0 0.10 μmhos/cm 4.0 0 10										

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD RPD	RPD Limit Qual
Batch 1805074 - SW8260B								
Blank (1805074-BLK1)								
Prepared & Analyzed: 05/07/2018								
Benzene	ND	0.50	ug/L					
Carbon disulfide	ND	2.0	ug/L					
Ethylbenzene	ND	0.50	ug/L					
Toluene	ND	0.50	ug/L					
Xylenes, Total	ND	1.5	ug/L					
<i>Surrogate: 4-Bromofluorobenzene</i>	25.0		ug/L	25.00	100	70-130		
<i>Surrogate: Dibromofluoromethane</i>	26.9		ug/L	25.00	107	70-130		
<i>Surrogate: Toluene-d8</i>	25.1		ug/L	25.00	100	70-130		
LCS (1805074-BS1)								
Prepared & Analyzed: 05/07/2018								
1,1-Dichloroethene	29		ug/L	25.00	114	70-130		
Benzene	27		ug/L	25.00	109	70-130		
Chlorobenzene	29		ug/L	25.00	115	70-130		
Toluene	25		ug/L	25.00	101	70-130		
Trichloroethene	26		ug/L	25.00	103	70-130		
<i>Surrogate: 4-Bromofluorobenzene</i>	24.6		ug/L	25.00	98	70-130		
<i>Surrogate: Dibromofluoromethane</i>	25.6		ug/L	25.00	102	70-130		
<i>Surrogate: Toluene-d8</i>	24.8		ug/L	25.00	99	70-130		
LCS Dup (1805074-BSD1)								
Prepared & Analyzed: 05/07/2018								
1,1-Dichloroethene	27		ug/L	25.00	110	70-130	4	30
Benzene	26		ug/L	25.00	104	70-130	5	30
Chlorobenzene	26		ug/L	25.00	105	70-130	9	30
Toluene	24		ug/L	25.00	96	70-130	5	30
Trichloroethene	25		ug/L	25.00	98	70-130	4	30
<i>Surrogate: 4-Bromofluorobenzene</i>	24.4		ug/L	25.00	98	70-130		
<i>Surrogate: Dibromofluoromethane</i>	26.1		ug/L	25.00	104	70-130		
<i>Surrogate: Toluene-d8</i>	25.1		ug/L	25.00	100	70-130		
Matrix Spike (1805074-MS1)								
Source: 18D0582-02 Prepared & Analyzed: 05/07/2018								
1,1-Dichloroethene	27		ug/L	25.00	0.070	109	70-130	
Benzene	26		ug/L	25.00	0.020	104	70-130	
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130	
Toluene	27		ug/L	25.00	3.5	95	70-130	
Trichloroethene	24		ug/L	25.00	0.040	97	70-130	
<i>Surrogate: 4-Bromofluorobenzene</i>	24.4		ug/L	25.00	98	70-130		
<i>Surrogate: Dibromofluoromethane</i>	26.4		ug/L	25.00	106	70-130		
<i>Surrogate: Toluene-d8</i>	24.9		ug/L	25.00	100	70-130		
Matrix Spike Dup (1805074-MSD1)								
Source: 18D0582-02 Prepared & Analyzed: 05/07/2018								
1,1-Dichloroethene	27		ug/L	25.00	0.070	108	70-130	0.8
Benzene	25		ug/L	25.00	0.020	101	70-130	2
Chlorobenzene	26		ug/L	25.00	0.0	105	70-130	0.3
Toluene	27		ug/L	25.00	3.5	95	70-130	0.1
Trichloroethene	24		ug/L	25.00	0.040	95	70-130	2
<i>Surrogate: 4-Bromofluorobenzene</i>	24.7		ug/L	25.00	99	70-130		
<i>Surrogate: Dibromofluoromethane</i>	26.4		ug/L	25.00	106	70-130		
<i>Surrogate: Toluene-d8</i>	25.3		ug/L	25.00	101	70-130		

Client: Brown & Caldwell
Project: PTF
Work Order: 18D0619
Date Received: 04/25/2018

QC Summary

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC Limits	RPD RPD	RPD Limit Qual
Batch 1804245 - E300.0 (2.1)								
Blank (1804245-BLK1)								
Prepared & Analyzed: 04/25/2018								
Chloride	ND	1.0	mg/L					
Fluoride	ND	0.50	mg/L					
Nitrogen, Nitrate (As N)	ND	0.50	mg/L					
Nitrogen, Nitrite (As N)	ND	0.10	mg/L					
Sulfate	ND	5.0	mg/L					
LCS (1804245-BS1)								
Prepared & Analyzed: 04/25/2018								
Chloride	12	1.0	mg/L	12.50	92	90-110		
Fluoride	2.0	0.50	mg/L	2.000	101	90-110		
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	95	90-110		
Nitrogen, Nitrite (As N)	2.3	0.10	mg/L	2.500	92	90-110		
Sulfate	12	5.0	mg/L	12.50	96	90-110		
LCS Dup (1804245-BSD1)								
Prepared & Analyzed: 04/25/2018								
Chloride	12	1.0	mg/L	12.50	94	90-110	2	10
Fluoride	2.0	0.50	mg/L	2.000	101	90-110	0.4	10
Nitrogen, Nitrate (As N)	4.9	0.50	mg/L	5.000	98	90-110	3	10
Nitrogen, Nitrite (As N)	2.4	0.10	mg/L	2.500	95	90-110	3	10
Sulfate	12	5.0	mg/L	12.50	98	90-110	3	10
Matrix Spike (1804245-MS1)								
Source: 18D0613-08 Prepared & Analyzed: 04/25/2018								
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120	
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	89	80-120	
Matrix Spike (1804245-MS2)								
Source: 18D0625-01 Prepared & Analyzed: 04/26/2018								
Nitrogen, Nitrate (As N)	5.0	0.50	mg/L	5.000	0.46	92	80-120	
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120	
Matrix Spike (1804245-MS3)								
Source: 18D0614-01RE1 Prepared & Analyzed: 04/26/2018								
Chloride	17		mg/L	12.50	6.4	88	80-120	
Sulfate	28		mg/L	12.50	18	85	80-120	
Matrix Spike Dup (1804245-MSD1)								
Source: 18D0613-08 Prepared & Analyzed: 04/25/2018								
Fluoride	3.7	0.50	mg/L	2.000	1.7	100	80-120	0.4
Nitrogen, Nitrate (As N)	4.7	0.50	mg/L	5.000	0.22	90	80-120	0.6
Matrix Spike Dup (1804245-MSD2)								
Source: 18D0625-01 Prepared & Analyzed: 04/26/2018								
Nitrogen, Nitrate (As N)	5.1	0.50	mg/L	5.000	0.46	92	80-120	0.2
Nitrogen, Nitrite (As N)	2.2	0.10	mg/L	2.500	ND	88	80-120	0.4
Matrix Spike Dup (1804245-MSD3)								
Source: 18D0614-01RE1 Prepared & Analyzed: 04/26/2018								
Chloride	18		mg/L	12.50	6.4	89	80-120	0.6
Sulfate	29		mg/L	12.50	18	86	80-120	0.6

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TestAmerica

THE LEADER IN ENVIRONMENTAL TESTING

ANALYTICAL REPORT

TestAmerica Laboratories, Inc.

TestAmerica Phoenix

4625 East Cotton Ctr Blvd

Suite 189

Phoenix, AZ 85040

Tel: (602)437-3340

[TestAmerica Job ID: 550-101943-1](#)

Client Project/Site: 18D0619

For:

Turner Laboratories, Inc.

2445 North Coyote Drive

Suite 104

Tucson, Arizona 85745

Attn: Kevin Brim

Authorized for release by:

5/16/2018 12:23:25 PM

Ken Baker, Project Manager II

(602)659-7624

ken.baker@testamericainc.com

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This report has been electronically signed and authorized by the signatory. Electronic signature is intended to be the legally binding equivalent of a traditionally handwritten signature.

Results relate only to the items tested and the sample(s) as received by the laboratory.

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Definitions/Glossary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Qualifiers

GC Semi VOA

Qualifier	Qualifier Description
Q9	Insufficient sample received to meet method QC requirements.

Glossary

Abbreviation **These commonly used abbreviations may or may not be present in this report.**

□	Listed under the "D" column to designate that the result is reported on a dry weight basis
%R	Percent Recovery
CFL	Contains Free Liquid
CNF	Contains No Free Liquid
DER	Duplicate Error Ratio (normalized absolute difference)
Dil Fac	Dilution Factor
DL	Detection Limit (DoD/DOE)
DL, RA, RE, IN	Indicates a Dilution, Re-analysis, Re-extraction, or additional Initial metals/anion analysis of the sample
DLC	Decision Level Concentration (Radiochemistry)
EDL	Estimated Detection Limit (Dioxin)
LOD	Limit of Detection (DoD/DOE)
LOQ	Limit of Quantitation (DoD/DOE)
MDA	Minimum Detectable Activity (Radiochemistry)
MDC	Minimum Detectable Concentration (Radiochemistry)
MDL	Method Detection Limit
ML	Minimum Level (Dioxin)
NC	Not Calculated
ND	Not Detected at the reporting limit (or MDL or EDL if shown)
PQL	Practical Quantitation Limit
QC	Quality Control
RER	Relative Error Ratio (Radiochemistry)
RL	Reporting Limit or Requested Limit (Radiochemistry)
RPD	Relative Percent Difference, a measure of the relative difference between two points
TEF	Toxicity Equivalent Factor (Dioxin)
TEQ	Toxicity Equivalent Quotient (Dioxin)

Case Narrative

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Narrative

**Job Narrative
550-101943-1**

Comments

No additional comments.

Receipt

The sample was received on 4/27/2018 10:50 AM; the sample arrived in good condition, properly preserved and, where required, on ice. The temperature of the cooler at receipt was 3.8° C.

GC Semi VOA

Method(s) 8015D: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate/sample duplicate (MS/MSD) associated with preparation batch 550-145985 and analytical batch 550-146884. Affected samples have been added a Q9 qualifier.
18D0619-01 (550-101943-1)

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Organic Prep

Method(s) 3510C: Insufficient sample volume was available to perform a matrix spike/matrix spike duplicate (MS/MSD) associated with 3510C.

No additional analytical or quality issues were noted, other than those described above or in the Definitions/Glossary page.

Sample Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Lab Sample ID	Client Sample ID	Matrix	Collected	Received
550-101943-1	18D0619-01	Water	04/23/18 15:55	04/27/18 10:50

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TestAmerica Phoenix

Detection Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01

Lab Sample ID: 550-101943-1

Analyte	Result	Qualifier	RL	Unit	Dil Fac	D	Method	Prep Type
ORO (C22-C32)	0.21	Q9	0.20	mg/L	1		8015D	Total/NA

This Detection Summary does not include radiochemical test results.

TestAmerica Phoenix

Client Sample Results

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01

Lab Sample ID: 550-101943-1

Matrix: Water

Date Collected: 04/23/18 15:55
Date Received: 04/27/18 10:50

Method: 8015D - Diesel Range Organics (DRO) (GC)

Analyte	Result	Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	0.21	Q9	0.20	mg/L	04/30/18 14:16	05/10/18 23:29		1
DRO (C10-C22)	ND	Q9	0.10	mg/L	04/30/18 14:16	05/10/18 23:29		1
Surrogate	%Recovery	Qualifier	Limits			Prepared	Analyzed	Dil Fac
<i>o-Terphenyl (Surr)</i>	79		10 - 150			04/30/18 14:16	05/10/18 23:29	1

Surrogate Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method: 8015D - Diesel Range Organics (DRO) (GC)

Matrix: Water

Prep Type: Total/NA

Percent Surrogate Recovery (Acceptance Limits)

Lab Sample ID	Client Sample ID	OTPH (10-150)															
550-101943-1	18D0619-01	79															
LCS 550-145985/2-A	Lab Control Sample	79															
LCSD 550-145985/3-A	Lab Control Sample Dup	79															
MB 550-145985/1-A	Method Blank	65															

Surrogate Legend

OTPH = o-Terphenyl (Surr)

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TestAmerica Phoenix

QC Sample Results

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method: 8015D - Diesel Range Organics (DRO) (GC)

Lab Sample ID: MB 550-145985/1-A

Matrix: Water

Analysis Batch: 146884

Client Sample ID: Method Blank

Prep Type: Total/NA

Prep Batch: 145985

Analyte	MB Result	MB Qualifier	RL	Unit	D	Prepared	Analyzed	Dil Fac
ORO (C22-C32)	ND		0.20	mg/L		04/30/18 14:15	05/11/18 11:16	1
DRO (C10-C22)	ND		0.10	mg/L		04/30/18 14:15	05/11/18 11:16	1
Surrogate	MB %Recovery	MB Qualifier	Limits			Prepared	Analyzed	Dil Fac
<i>o-Terphenyl (Surr)</i>	65		10 - 150			04/30/18 14:15	05/11/18 11:16	1

Lab Sample ID: LCS 550-145985/2-A

Matrix: Water

Analysis Batch: 146884

Client Sample ID: Lab Control Sample

Prep Type: Total/NA

Prep Batch: 145985

Analyte		Spike Added	LCS Result	LCS Qualifier	Unit	D	%Rec.	
ORO (C22-C32)		1.60	1.59		mg/L		99	69 - 107
DRO (C10-C22)		0.400	0.450		mg/L		113	42 - 133
Surrogate		LCS %Recovery	LCS Qualifier	Limits				Limits
<i>o-Terphenyl (Surr)</i>		79		10 - 150				

Lab Sample ID: LCSD 550-145985/3-A

Matrix: Water

Analysis Batch: 146884

Client Sample ID: Lab Control Sample Dup

Prep Type: Total/NA

Prep Batch: 145985

Analyte		Spike Added	LCSD Result	LCSD Qualifier	Unit	D	%Rec.		RPD	
ORO (C22-C32)		1.60	1.59		mg/L		100	69 - 107	0	20
DRO (C10-C22)		0.400	0.447		mg/L		112	42 - 133	1	22
Surrogate		LCSD %Recovery	LCSD Qualifier	Limits				Limits	RPD	Limit
<i>o-Terphenyl (Surr)</i>		79		10 - 150						

TestAmerica Phoenix

QC Association Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

GC Semi VOA

Prep Batch: 145985

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	3510C	
MB 550-145985/1-A	Method Blank	Total/NA	Water	3510C	
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	3510C	
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	3510C	

Analysis Batch: 146884

Lab Sample ID	Client Sample ID	Prep Type	Matrix	Method	Prep Batch
550-101943-1	18D0619-01	Total/NA	Water	8015D	145985
MB 550-145985/1-A	Method Blank	Total/NA	Water	8015D	145985
LCS 550-145985/2-A	Lab Control Sample	Total/NA	Water	8015D	145985
LCSD 550-145985/3-A	Lab Control Sample Dup	Total/NA	Water	8015D	145985

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Lab Chronicle

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Client Sample ID: 18D0619-01

Lab Sample ID: 550-101943-1

Matrix: Water

Date Collected: 04/23/18 15:55

Date Received: 04/27/18 10:50

Prep Type	Batch Type	Batch Method	Run	Dilution Factor	Batch Number	Prepared or Analyzed	Analyst	Lab
Total/NA	Prep	3510C			145985	04/30/18 14:16	REM	TAL PHX
Total/NA	Analysis	8015D		1	146884	05/10/18 23:29	TC1	TAL PHX

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

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TestAmerica Phoenix

Accreditation/Certification Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Laboratory: TestAmerica Phoenix

Unless otherwise noted, all analytes for this laboratory were covered under each accreditation/certification below.

Authority	Program	EPA Region	Identification Number	Expiration Date
Arizona	State Program	9	AZ0728	06-09-18
Analysis Method	Prep Method	Matrix	Analyte	

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TestAmerica Phoenix

Method Summary

Client: Turner Laboratories, Inc.
Project/Site: 18D0619

TestAmerica Job ID: 550-101943-1

Method	Method Description	Protocol	Laboratory
8015D	Diesel Range Organics (DRO) (GC)	SW846	TAL PHX
3510C	Liquid-Liquid Extraction (Separatory Funnel)	SW846	TAL PHX

Protocol References:

SW846 = "Test Methods For Evaluating Solid Waste, Physical/Chemical Methods", Third Edition, November 1986 And Its Updates.

Laboratory References:

TAL PHX = TestAmerica Phoenix, 4625 East Cotton Ctr Blvd, Suite 189, Phoenix, AZ 85040, TEL (602)437-3340

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TestAmerica Phoenix

SUBCONTRACT ORDER

Turner Laboratories, Inc.

18D0619
101943SENDING LABORATORY:

Turner Laboratories, Inc.
 2445 N. Coyote Drive, Ste #104
 Tucson, AZ 85745
 Phone: 520.882.5880
 Fax: 520.882.9788
 Project Manager: Kevin Brim

RECEIVING LABORATORY:

TestAmerica Phoenix
 4625 East Cotton Center Boulevard Suite 189
 Phoenix, AZ 85540
 Phone :(602) 437-3340
 Fax:
 Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
-01			
Sample ID: 18D0619-01 Drinking Water Sampled:04/23/2018 15:55	04/30/2018 15:55	8015D Sub	8015D DRO and ORO Paramters Only

Containers Supplied:

8015D Sub
 o-Terphenyl
 C10-C32 (Total)
 C22-C32 (Oil Range Organics)
 C10-C22 (Diesel Range Organics)
 C6-C10 (Gasoline Range Organics)



TA-PHX

3,8' L UPS GR

Released By

41263118

Date

Received By

Released By

Date

Received By

Date

Login Sample Receipt Checklist

Client: Turner Laboratories, Inc.

Job Number: 550-101943-1

Login Number: 101943

List Source: TestAmerica Phoenix

List Number: 1

Creator: Gravlin, Andrea

Question	Answer	Comment	
Radioactivity wasn't checked or is </= background as measured by a survey meter.	True		1
The cooler's custody seal, if present, is intact.	True		2
Sample custody seals, if present, are intact.	True		3
The cooler or samples do not appear to have been compromised or tampered with.	True		4
Samples were received on ice.	True		5
Cooler Temperature is acceptable.	True		6
Cooler Temperature is recorded.	True		7
COC is present.	True		8
COC is filled out in ink and legible.	True		9
COC is filled out with all pertinent information.	True		10
Is the Field Sampler's name present on COC?	True		11
There are no discrepancies between the containers received and the COC.	True		12
Samples are received within Holding Time (excluding tests with immediate HTs)	True		13
Sample containers have legible labels.	True		14
Containers are not broken or leaking.	True		15
Sample collection date/times are provided.	True		
Appropriate sample containers are used.	True		
Sample bottles are completely filled.	True		
Sample Preservation Verified.	True		
There is sufficient vol. for all requested analyses, incl. any requested MS/MSDs	True		
Containers requiring zero headspace have no headspace or bubble is <6mm (1/4").	True		
Multiphasic samples are not present.	True		
Samples do not require splitting or compositing.	True		
Residual Chlorine Checked.	False	Check done at department level as required.	



Radiation Safety Engineering, Inc.

3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121

Website: www.radsafe.com

(480) 897-9459

FAX (480) 892-5446

Radiochemical Activity in Water (pCi/L)

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

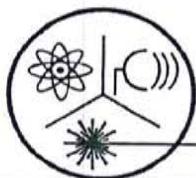
Sampling Date: April 23, 2018
Sample Received: May 01, 2018
Analysis Completed: May 22, 2018

Sample ID	Gross Alpha Activity Method 600/00-02 (pCi/L)	Uranium Activity Method ASTM D6239 (pCi/L)	Adjusted Gross Alpha (pCi/L)	Radium 226 Activity Method GammaRay HPGE (pCi/L)	Radium 228 Activity Method GammaRay HPGE (pCi/L)	Total Radium (pCi/L)
18D0619-01	17.7 ± 0.9	12.9 ± 1.2	4.8 ± 1.5	3.1 ± 0.3	3.1 ± 0.4	6.2 ± 0.5

Date of Analysis	5/2/2018	5/21/2018	5/21/2018	5/4/2018	5/4/2018	5/4/2018
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Alt 2. retest

Robert L. Metzger, Ph.D., C.H.P. Date _____
Laboratory License Number AZ0462



Radiation Safety Engineering, Inc.

3245 N. WASHINGTON ST. • CHANDLER, ARIZONA 85225-1121

Website: www.radsafe.com

(480) 897-9459

FAX (480) 892-5446

Isotopic Uranium Analysis

Turner Laboratories
2445 N. Coyote Drive, Ste. 104
Tucson, AZ 85745

Sampling Date: April 23, 2018

Sample Received: May 01, 2018

Uranium Analysis Date: May 21, 2018

Sample No.	^{238}U	^{235}U	^{234}U	Total	
18D0619-01	6.0 ± 0.6	0.280 ± 0.004	6.6 ± 0.6	12.9 ± 1.2	Activity (pCi/L)
	17.9 ± 1.7	0.131 ± 0.002	0.00106 ± 0.00010	18.0 ± 1.7	Content ($\mu\text{g}/\text{L}$)
Comments:					

Metzger
Robert L. Metzger, Ph.D., C.H.P. 5/22/2018
Date
Laboratory License Number AZ0462

Arizona Department of Environmental Quality
Drinking Water Radionuclides-Adjusted Gross Alpha, Radium 226 & 228, Uranium Analysis Report
Samples To Be Taken At Entry Point Into Distribution System (EPDS) Only

PWS ID#: AZ04 _____ PWS Name: _____

April 23, 2018 15:55 (24 hour clock)
Sample Date Sample Time Owner/Contact Person

Owner/Contact Fax Number Owner/Contact Phone Number

Sample Collection Point
 EPDS # _____

Compliance Sample Type:

- Reduced Monitoring
- Quarterly
- Composite of four quarterly samples

Date Q1 collected: _____
Date Q2 collected: _____
Date Q3 collected: _____
Date Q4 collected: _____

*****RADIOCHEMICAL ANALYSIS*****

>>>To be filled out by laboratory personnel<<<

*****Combined Uranium must be reported in micrograms per liter*****

Analysis Method	MCL	Reporting Limit	Contaminant Name	Cont. Code	Analyses Run Date	Result	Exceed MCL
	15 pCi/L		Adjusted Gross Alpha	4000	5/21/2018	4.8 ± 1.5	
600/00-02		3 pCi/L	Gross Alpha	4002	5/2/2018	17.7 ± 0.9	
7500 - Rn			Radon	4004			
ASTM D6239	30 µg/L	1 µg/L	Combined Uranium	4006	5/21/2018	18.0 ± 1.7 µg/L	
			Uranium 234	4007	5/21/2018	0.00106 ± 0.00010	
			Uranium 235	4008	5/21/2018	0.131 ± 0.002	
			Uranium 238	4009	5/21/2018	17.9 ± 1.7	
	5 pCi/L	1 pCi/L	Combined Radium (226,228)	4010	5/4/2018	6.2 ± 0.5	X
GammaRay HPGE		1 pCi/L	Radium 226	4020	5/4/2018	3.1 ± 0.3	
GammaRay HPGE		1 pCi/L	Radium 228	4030	5/4/2018	3.1 ± 0.4	

*****LABORATORY INFORMATION*****

>>>To be filled out by laboratory personnel<<<

Specimen Number: RSE60312

Lab ID Number: AZ0462

Lab Name: Radiation Safety Engineering, Inc.

Printed Name and Phone Number of Laboratory Contact: Robert L. Metzger, Ph.D., C.H.P. (480) 897-9459

Comments: 18D0619-01

Authorized Signature: *Robert L. Metzger*

Date Public Water System Notified:

SUBCONTRACT ORDER

Turner Laboratories, Inc.

18D0619SENDING LABORATORY:

Turner Laboratories, Inc.
 2445 N. Coyote Drive, Ste #104
 Tucson, AZ 85745
 Phone: 520.882.5880
 Fax: 520.882.9788
 Project Manager: Kevin Brim

RECEIVING LABORATORY:

Radiation Safety Engineering, Inc.
 3245 N. Washington St.
 Chandler, AZ 85225-1121
 Phone : (480) 897-9459
 Fax: (480) 892-5446
 Please CC Kevin Brim Kbrim@turnerlabs.com

Analysis	Expires	Laboratory ID	Comments
Sample ID: 18D0619-01 Drinking Water Sampled:04/23/2018 15:55			
Radiochemistry, Gross Alpha	10/20/2018 15:55		Analyze Uranium and Adjusted Alpha if G. Alpha is > 12
Radiochemistry, Radium 226/228	05/23/2018 15:55		
<i>Containers Supplied:</i>			

*# 60312**[Signature]*4/30/18
Date16:00
ups

Received By

4/30/18
Date

16:00

Released By

Date

Received By

Date

APPENDIX D

Well Completion Documentation

PIPE TALLY

Project Name:	FCI 714	Project No.:	124607-007
Well No.:	I-52	Date:	11/17/17 - 11/18/17
Location:	Florence AZ	Pipe Tally for:	Oberholser 6250'ns Overburden Losses
Total Depth:	505	Geologist:	ZSMP

Type of Connections: Welded T+C Flush Thread Other

Collard

→ scl 18.741
BGS

Notes:
1 - Fusion Bonded Polyetherimide
2mm Carbon Steel 74-00
0.312" Wall Belvelco EWD

~~Conor Shee 2.12 ft~~

Cold Carbon Steel 1/4" OD x 0.317" Wall Sora Bond & Colored

Correlators every 40' at bottom of joint starting on

SUMMARY OF TALLY	
Total Length tallied:	520.16 ft
Casing Stick-Up:	20.1 ft
Length of Casing Cut-Off:	—
Bottom of Well:	500 ft
Screened Interval:	—
Total Screen in Hole:	—

526.1
1.02
1920.08

HALEY ALDRICH

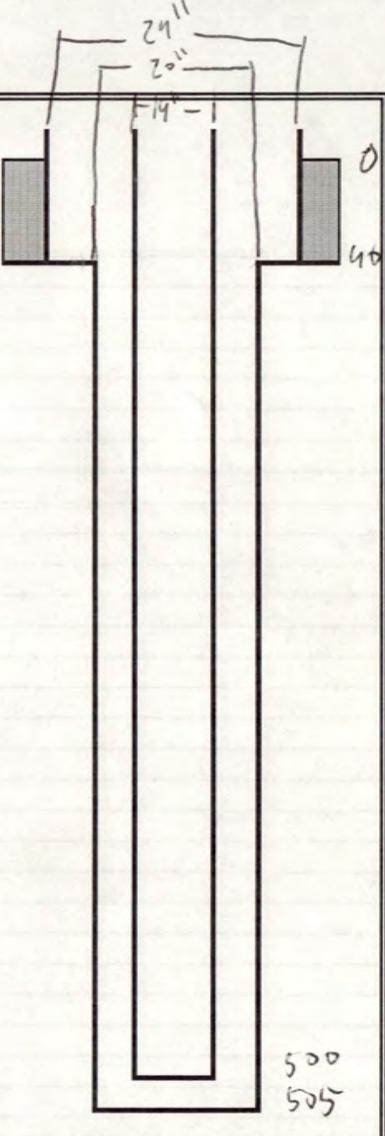
ESTIMATED ANNULAR MATERIAL RECORD

Project Name: PTF
Well No.: 5-02

Project #: 1-456-001
Geologist: Z. S. N.

Date: 11/17/17

SW = Casing 905. 107.18 m
estim
7 26 2017



ANNULAR VOLUME CALCULATIONS

Total Depth of Borehole [T]:

605 feet
20 inches
— feet
— inches
500 feet
14 inches

Total Cased Depth:

500 feet
10.904 Ft³
5 feet
— inches

Borehole Diameter [D]:

Rat Hole Volume [R=(D²) 0.005454*L_r]:

Screen Length [L_s]:

Rat Hole Length [L_r]:

Screen Diameter [d_s]:

Camera Tube Length [L_{ct}]:

Casing Length [L_c]:

Camera Tube Diameter [d_{ct}]:

Casing Diameter [d_c]:

Screen Annular Volume (A_s): (D²-d_s²) 0.005454 =

— Ft³/Lin. Ft

Casing Annular Volume (A_c): (D²-d_c²) 0.005454 =

1.11 Ft³/Lin. Ft

Casing/Cam.Tube Annular Volume (A_{c+ct}): (D²-d_c²-d_{ct}²) 0.005454 =

— Ft³/Lin. Ft

EQUATIONS

2,700 lbs. Silica Sand = 1 cubic yard = 27 cubic feet

Bentonite Sack = 0.69 ft³

¹ Volume of bag (Ft³) = bag weight/100

Silica Sand Super Sack = 3000 lbs.

² Calculated depth = Previous Calculated depth - (v/A)

No.	✓	Weight of Bag (lbs.)	Volume of Bag ¹ (v) (ft ³)	Total Vol. of Bags (ft ³)	Calculated Depth ² (ft bsls)	Tagged Depth (ft bsls)	Comments
1	✓	-	-	700	-192.3	surface	Type V Concrete

$$V = 10.904 + (24^2 - 14^2) 0.005454(40) + (20^2 - 14^2) 0.005454(500 - 40) = 22.43 \text{ yd}^3 \approx 177.86 \text{ bbls}$$

min Slurry

Pump Volume = 160 bbls Slurry

~125 % **HALEY ALDRICH**

Casing Layout

Project Name.: Florence Copper INC		Project No.: 129687-007				
Well No.: I-02		Date: 2.17.18				
Location: Florence AZ		Layout for: Lower				
Total Depth: 1200.93		Geologist: G. Foushee, T. Snow				
Pipe Length	Depth BGS	Pipe Length	Depth BGS	Pipe Length	Depth BGS	Sensor Details
20.03	23	780.51	289.03		69	
		800.54	317.89		68	
20.04	22	28.86	46		67	
		820.58	346.72		66	
20.03	21	28.83	45		65	
		840.61	375.55		64	
20.02	20	28.83	44		63	
		860.63	404.38		62	
20.03	19	28.97	43		61	
		880.66	433.35		0.00	
9.76	18	28.89	42		60	
		890.42	462.24		0.00	
10.01	17	28.83	41		59	
		900.43	491.07		-1.40	
20.03	16	28.84	40		58	
		920.46	519.91		-0.60	
20.01	15	0.50	38		57	
		940.47	520.41		0.30	
20.01	14	20.05	37		56	
		960.48	540.46		29.17	
20.01	13	20.03	36		55	
		980.49	560.49		58.05	
20.02	12	20.04	35		54	
		1000.51	580.53		86.93	
20.00	11	20.03	34		53	
		1020.51	600.56		115.78	
20.00	10	20.02	33		52	
		1040.51	620.58		144.65	
20.00	9	20.02	32		51	
		1060.51	640.60		173.54	
20.00	8	9.77	31		50	
		1080.51	650.37		202.41	
20.01	7	10.01	30		49	
		1100.52	660.38		231.29	
19.98	6	20.01	29		48	
		1120.50	680.39		260.16	
20.02	5	20.01	28		47	
		1140.52	700.40		289.03	
20.00	4	20.03	27			
		1160.52	720.43			
20.01	3	20.02	26			
		1180.53	740.45			
20.00	2	20.04	25			
		1200.53	760.49			
0.40	1	20.02	24			
		1200.93	780.51			

Notes:

PIPE TALLY

Project Name.: FC I	Project No.: 129687
Well No.: 1-02	Date: 2/17/18
Location: Florence	Pipe Tally for: WELL INSTALL
Total Depth: 1200	Geologist: G. LEONARD, T. SNOW

Type of Connections: Welded T+C Flush Thread Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Dist. from sensor bottom to bottom of pipe (feet)	Sensor Type (ACD, CS, ERT)	Sensor ID	Wire Lead ID	Depth of Sensor (feet bgs)
1	✓	0.40	0.40	31633 5m160					
2	✓	20.00	20.40	Sch 30 .080 Slat PVC					
3	*	20.01	40.41						
4	✓	20.00	60.41						
5	*	20.02	80.43						
6	✓	19.93	100.41						
7	*	20.01	120.42						
8	✓	10.00	130.42						
9	*	10.40	140.42						
10	✓	20.00	160.42						
11	*	20.00	180.42						
12	✓	20.02	200.44						
13	*	20.01	220.45						
14	✓	20.01	240.46						
15	*	20.01	260.47						
16	✓	20.03	280.50						
17	✓	20.04	300.54						
17	✓	10.01	310.51	SS Blank					
18	*	9.76	320.27	SS Blank					
19	✓	30.63	340.30	Sch. 30 .080 Slat PVC					
20	*	20.02	360.32						
21	✓	20.03	380.35						
22	*	20.04	400.39						
23	✓	20.03	420.42						
24	*	20.02	440.44						
25	✓	20.04	460.48						
26	*	20.02	480.50						
27	✓	20.03	500.53						
28	*	20.01	520.54						
29	✓	20.01	540.55						

Notes:

SCREEN - SCH 80 PVC, NOM 5".
0.080" SLOTS, 5.56" OD, 4.75" ID

SS Blank (TOM dimensions)

FRP = FIBERGLAS PLATE NOM 5"

CAT PER → 5.62" OD, 4.74" ID, 10' spacers

OD = 6.60"

PVC EOD X over SS 0.15" thick

SUMMARY OF TALLY

Total Length tallied:

1207.42

Casing Stick-Up:

1.40 (6.48 TEMPORARY)

5.08

Length of Casing Cut-Off:

1200.74

Bottom of Well:

1200.74

Screened Interval: 1200.59 - 900.44, 880.67 - 680.20, 640.61 - 520.42

Total Screen in Hole: 640.57

Sensor Types: Annular Conductivity Device (ACD), installed as pairs with 3 ft spacing

Conductivity Sensor (CS) 4 sensors with sing lead 20 ft spacing

Electrical Resistivity Tomography (ERT)

* CENTRALIZERS EVERY 40' DENOTED BY *

HALEY ALDRICH,

+220128

120.19

PIPE TALLY

Project Name.: <u>FCI</u>	Project No.: <u>129687</u>
Well No.: <u>I-02</u>	Date: <u>2/17/1</u>
Location: <u>FLORIDA</u>	Pipe Tally for: <u>WELL INSTALL</u>
Total Depth: <u>1225 DRILLED, 1200 BUILT</u>	Geologist: <u>JOHN SNOW, JR. BUSHMAN</u>

Type of Connections: Welded T+C Flush Thread Other

Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type	Pipe	✓	Length (ft)	Length Σ (ft)	Pipe Type
30	✓	10.01	550.56	SS BLANK					
31	X	9.77	560.33	↓					
32	✓	20.02	580.35	SCREWDOWN 0.000 SPLIT					
33	X	20.02	600.37						
34	✓	20.03	620.40						
35	X	20.04	640.44						
36		20.03	660.47						
37	X	20.05	680.52	↓					
38	✓	0.15	681.02	X OVER PVC EOP					
39	✓	28.84	709.86	FRP					
40	✓	28.83	738.69						
41	X	28.89	767.58						
42	✓	28.97	796.55						
43	X	28.83	825.38						
44	✓	28.83	854.21						
45	✓	28.83	883.04						
46	✓	28.86	911.90						
47	✓	28.87	940.77						
48	✓	28.88	969.64						
49	✓	28.88	998.52						
50	✓	28.87	1027.39						
51	✓	28.84	1056.23						
52	✓	28.87	1085.10						
53	✓	28.85	1114.00						
54	✓	28.68	1142.88						
55	✓	28.88	1171.76						
56	✓	28.82	1201.63						
57	✓	0.90	1201.53						
58	✓	0.80	1201.33						
59	✓	3.34	1205.67						
60	✓	1.75	1207.42						

SUMMARY OF TALLY

Total Length tallied: 1207.42

Length of Packer element:

Top of Packer Element

Bottom of Packer Element:

Packer Element Interval:

Perforated Interval: 7A142Notes: SEE PG ONE FOR SUMMARY & COMPLETE NOTES

TOP OF BEAM TO NRM: 4.70', BZL 1.703, 30

HALEY
ALDRICHHALEY
ALDRICH

113

CENTRE
SCREEN

ESTIMATED ANNULAR MATERIAL RECORD

Project Name: FCJ
Well No.: I-02Project #: 129687-007
Geologist: T. Snow / G. Farabee

Date: 2/13/13

Total Depth of Borehole [T]: 102.19 feet
 Borehole Diameter [D]: 12.25 inches
 Screen Length [L_s]: 6.50 feet
 Screen Diameter [d_s]: 5.36 inches
 Casing Length [L_c]: 520 feet
 Casing Diameter [d_c]: 5.56 inches

Total Cased Depth: 1262.33 feet
 Rat Hole Volume [R=(D²) 0.005454*L]: 13.09 Ft³
 Rat Hole Length [L_r]: 16.67 feet
 Camera Tube Length [L_{ct}]: _____ feet
 Camera Tube Diameter [d_{ct}]: _____ inches

Screen Annular Volume (A_s): (D²-d_s²) 0.005454 =0.67 Ft³/Lin. FtCasing Annular Volume (A_c): (D²-d_c²) 0.005454 =0.65 Ft³/Lin. FtCasing/Cam.Tube Annular Volume (A_{c+ct}): (D²-d_c²-d_{ct}²) 0.005454 =Ft³/Lin. Ft

EQUATIONS

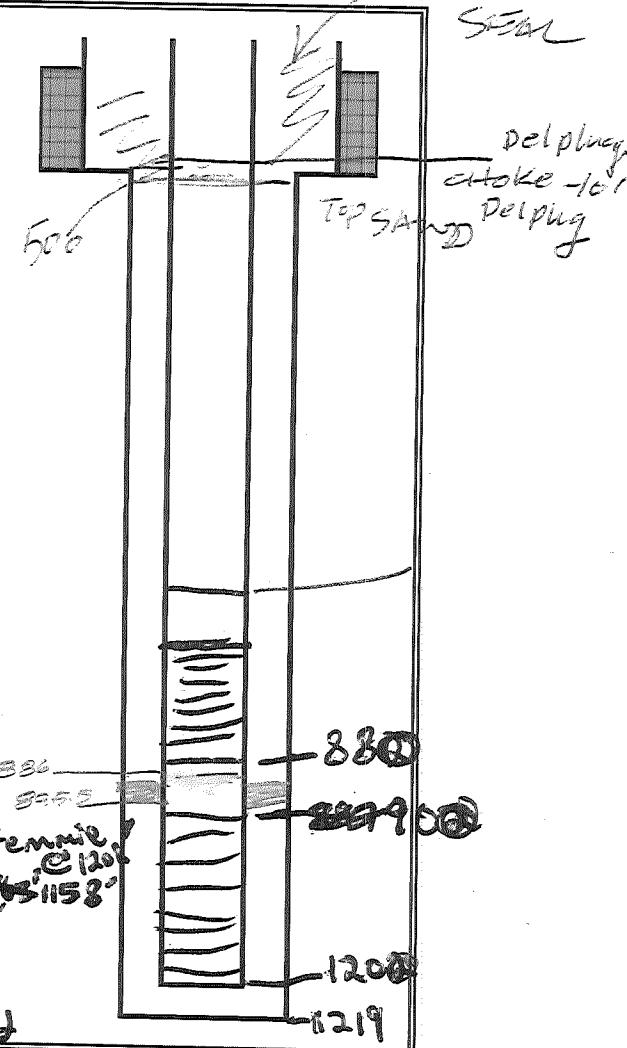
2,700 lbs. Silica Sand = 1 cubic yard = 27 cubic feet

Bentonite Sack = 0.69 ft³¹ Volume of bag (Ft³) = bag weight/100

Silica Sand Super Sack = 3000 lbs.

² Calculated depth = Previous Calculated depth - (v/A)

No.	✓	Weight of Bag (lbs.)	Volume of Bag ¹ (v) (ft ³)	Total Vol. of Bags (ft ³)	Calculated Depth ² (ft bls)	Tagged Depth (ft bls)	Comments
1	✓	750	7.5	7.5	1209.51	—	#6 Sand Super Sack Tremie, C 120'
2	✓	3000	30	37.5	1173.37	—	#6 Super Sack Tremie @ 115'
3	✓	3000	30	67.5	1145.07	1130	#6 Super Sack Tremie @ 1158"
4	✓	3000	30	97.5	1094	—	Tremie 1096" #6 Super Sack
5	✓	3000	30	127.5	1062	—	Tremie 1062" #6 Sand
6	✓	3000	30	157.5	1039	1040	Tremie 1032" #6 Sand
7	✓	3000	30	187.5	1028	—	Tremie 1001" #6 Sand



4/3

ESTIMATED ANNULAR MATERIAL RECORD (Continued)

Project Name: PCI
Well No.: I-02Project No.: 129697
Date: 2/18/18

Geologist: T. Snow, G. Foushee

No.	✓	Weight of Bag (lbs.)	Volume of Bag ¹ (v) (ft ³)	Total Vol. of Bags (ft ³)	Calculated Depth ² (ft bbls)	Tagged Depth (ft bbls)	Comments
8	✓	3000	30	2167.5	1012	—	See gravel near top of tremie ~100' #12 Sand, Tremie 971'
9	✓	3000	30	247.5	972	957	Tremie 939' #6 Sand
10	✓	3000	30	277.5	941	934	Tremie 903' #6 Sand
11	✓	3000	30	307.5	901	890	2/11 ONE, NEW TREMIE E 871', SWAB 1780-1700' TAG @ 902.
12	✓	3000	75	322.5	881.5	895.5	SWAB 1000-1100', TAG 903', SWAB 10 min. SWAB 1100-1150', TAG @ 903'. GET TO SWAB SWAB 1100-1150', SWAB 1150-1200', TAG 903'.
13	✓	750±60	7.5	230	885	886	ADD 1/4 BLB. TAG 901 BLB, ADD ANOTHER 1/4 BLB @ 875'
14	✓	1500	15	345	876	—	871' LULL DRAFTING. SO TREMIE @ 871', SWAB SACK 871' 2000L
15	✓	3000	30	375	830	—	845' LULL SACK 13' OF #6 - DRAFTING. 2000L @ 832'
16	✓	3000	30	405	784	817'	812' DRAFTING. NOW @ 783' BLB
17	✓	3000	30	435	766	720'	TAKES WHOLE SACK, THEN BLOCKS. SO LEVEL = 780'
18	✓	3000	30	465	734	—	722' DRAFTING. SO BOTTOM = 7400' BLB. PULL ANOTHER BOTTOM = 720' BLB, SWAB SACK #6 Sand
19	✓	3000	30	495	694	—	PULL ONE BOTTOM = 689' BLB #11. SUPER SACK #6 Sand
20	✓	3000	30	525	668	—	PULL ONE BOTTOM = 658' BLB = 18' SWAB SACK #6 Sand
21	✓	1500	15	540	655	669	PULL ONE BOTTOM = 657' BLB = 18' SUPER SACK #6 Sand
22	✓	1500	15	555	655	655	1/4 Super Sack #6 Sand
—	—	—	—	—	664.5	—	SWAB 880'-770' FOR 15 MIN
—	—	—	—	—	665	—	SWAB 880'-770' FOR 10 MIN
—	—	—	—	—	668	—	SWAB 770'-1000' FOR 15 MIN
—	—	—	—	—	669.5	—	SWAB 770'-1000' FOR 10 MIN
—	—	—	—	—	670	—	SWAB 770'-1000' FOR 10 MIN

Notes:

ESTIMATED ANNULAR MATERIAL RECORD (Continued)

Project Name: FC I
Well No.: I-02

Project No.: 129657-001
Date: 2/19/13

Geologist: Tom SNOW G. COUSINE

No.	✓	Weight of Bag (lbs.)	Volume of Bag ¹ (v) (ft ³)	Total Vol. of Bags (ft ³)	Calculated Depth ² (ft bbls)	Tagged Depth (ft bbls)	Comments
21	✓	1500	15	570	635	655.5	#6 Super Sack
22	✓	1150	11.5	581.5	646	650	23 bags of #6 Sand, tremie = 1037' (avg 307 ft added)
23	✓	550	5.5	587	6410	645	11 bags of #6 Sand
24	✓	1500	15	702	684	—	Pull tremie to 598'. #6 Sand Super Sack
25	✓	3000	30	732	610	—	#6 Sand Super Sack
26	✓	3000	30	762	584	—	Pull tremie to 566'. #6 Sand Super Sack
27	✓	3000	30	792	559	549	PULL TREMIE NEW BOTTOM = 2415', PULL ON @ 504'
28	✓	3000	30	822	530	528	ADDED SS 18, #6 gravel. DRAUGHT 17 TO 528'
29	✓	2000	30	952	505	502	ADDITION SS 29.
30	✓	12x100	2	954	507	502	ADDO 2 - 5 gal buckets #6. NO CHANCE.
					506		SWAB INTERVAL THEN WILL TOP OFFS NEEDED. SWAB 50 - 540'
					506		10 more min - IN SAME INTERVAL. NO CHANCE.
31	✓	12x100	12	866	500	500	ADDED 12x5 gal Buckets #6. DONWELL #6.
32	✓	1 BAG	1	867	—	—	1 - DOZ DEL DUG
33		18x60	9	0.2610	489	490E	18 SACKS #60", 60 LBS ea.
34	✓	12x60	1	877	—	490	1 - DOZ DEL DUG
35		426.6	1303	—	—	—	76 BARRELS 110# CEMENT GROUT 15.6 YARDS, 103% OF EXPECTED,

Notes: USED: 24 SS of #6 (+ 14-5gal Buckets of #6)

57 50lb. Boxes of #60

2 DOZES of Del Dug (5 barrels)

CALCULATED 15.36 YARDS OF CEMENT FROM CEMENT LOG, 16.129 YARDS Δ $\pi(r^2 - R^2)$. +

CEMENT WEIGHS IN AT 14.1 TO 14.7 lbs/gallon



58776426

T-02

Plant:	Begin Loading:	To Job:	Arrive Job:	Start Unload:	Finish Unload:	Leave Job:	Return Plant:
00374103							

Customer Code: Customer Name: Customer Job Number: Order Code / Date:
Project Code: Project Name: Project P.O. Number: Order P.O. Number:
Ticket Date: Delivery Address: Map Page: Map/Row/Column:
Delivery Instructions: *MAIN GATE #9 SIDE OF HUNT HWY 8 W/DO PINAL PKWY** Dispatcher:
BATCH RECORDS TYPE II CEMENT
Ticket Number: 44352296

Due On Job:	Slump:	Truck Number:	Driver Number:	Driver Name:	End Use:
-------------	--------	---------------	----------------	--------------	----------

LOAD QUANTITY	CUMULATIVE QUANTITY	ORDERED QUANTITY	MATERIAL CODE	PRODUCTION DESCRIPTION	UOM	UNIT PRICE	AMOUNT
8.00	8.00	8.00	1333049	TYPE II 70 SLURRY 21 SR CNTZL YDS	EN		

DCT 18 PM 1:20

<input type="checkbox"/> Cash	Cash Check # / Auth Code:	Signature of Driver Receiving Cash:	Cash Received:	Total COD Order Amount to Collect Without Standby Charges:
<input type="checkbox"/> Check				
<input type="checkbox"/> Charge				

Comments:	WATER ADDED: _____ GAL YARDS IN DRUM: _____ WHEN ADDED.
	SIGNATURE

CURB LINE CROSSSED AT OWNER'S/AGENT'S REQUEST:

SIGNATURE

LOAD WAS TESTED BY: _____

SIGNATURE

Notice: Our drivers will make every effort to place materials where the customer designates, but the Company assumes no responsibility for damages inside curb or property line. Customer agrees to the terms of sale and delivery and accepts concrete as is. Due to important factors which are out of our control after delivery, this Company will not accept any responsibility for the finished results. No credit for returned concrete. Buyers exceptions and claims shall be deemed waived unless made to us in writing within one business day after the receipt of materials.

SPECIAL TERMS: Any water added is at customers own risk. If water is added on job, concrete strength is no longer guaranteed. WARNING: Product may cause skin and/or eye irritation. CAUTION: Material may be hazardous to your safety and health. Please refer to the backside of this ticket for important safety handling information, and to the material safety data sheets for additional information.

AUTHORIZED SIGNATURE:

(X)

92573305

41070220


BASIC
 ENERGY SERVICES

 3451 LeTourneau
 Gillette, WY 82718
 307-682-5258

Cementing Ticket

No. 1719

21331A

Date 11/17/17	Customer Order No.		Sect.	Twp.	Range	Truck Called Out	On Location 5:00p	Job Began 3:00a	Job Completed 5:30a
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Owner Florence Copper Mine	Contractor	Charge To Hydro Resources West
--------------------------------------	------------	--

Mailing Address	City	State
-----------------	------	-------

Well No. & Form	Place		County	Pinal	State
IO #2			Az.		

Depth of Well	Depth of Job 500	Casing (New) Used	Size 14 3/4	Size of Hole Amt. and Kind of Cement	20 675	(Cement Left in casing by)	Request Necessity	feet
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Kind of Job	Surface	Drillpipe	Rotary	Truck No.	28983
-------------	---------	-----------	--------	-----------	-------

Price Reference No.	Safety meeting water ahead 10bbis. mix 600sks cemt. class 25. @				
Price of Job	14.5# shutdown. wash up to pit.				

Second Stage _____

Pump Truck Mileage 3825.00

P.U. Mileage 765.00

Other Charges _____

Total Charges 7,131.00

Cementer Jim Lead Yield 1.38 Lead Wt. 14.5 Lead Water 6.8 SV 167

Helper Bryan Tail Yield _____ Tail Wt. _____ Lead Water _____ SV _____

District Gillette State Wyo.

The above job was done under supervision of the owner, operator, or his agent whose signature appears below.

Agent of contractor or operator _____

Sales Ticket for Materials Only

QUANTITY SACKS	BRAND AND TYPE	PRICE	TOTAL
16	crew subsistence	500.0	8,000.00
8	tranfer cement.	150.00	1,200.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
			0.00
Plugs			0.00
Equipment #	HRS	680 Handling & Dumping	2.44 1,659.20
28983	1	Mileage	0.00
84127/8544		Sub Total	17,990.20
		Discount	
		Sales Tax	
		Total	

Signature of operator



3451 LeTourneau
Gillette, WY 82718
307-682-5258

Cementing Ticket No. 1719

21377

Date 02-20-18	Customer Order No.		Sect.	Twp.	Range	Truck Called Out 1:45	On Location 2:30	Job Began 4:00	Job Completed 5:30
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Owner Florance Copper Mine	Contractor Hydro Resources	Charge To Hydro West
--------------------------------------	--------------------------------------	--------------------------------

Mailing Address	City	State
-----------------	------	-------

Well No. & Form Injection well 02	Place copper mine	County Pinal	State AZ
---	-----------------------------	------------------------	--------------------

Depth of Well 1227	Depth of Job 477	Casing (New) Size 5.5	Size of Hole 14	(Cement Left) Request in casing by 0 feet
		Used Weight	Amt. and Kind of Cement 2/5	

Kind of Job Injection Well	Drillpipe 2 7/8	(Rotary) Cable	Truck No. 28983
--------------------------------------	---------------------------	---------------------	---------------------------

Price Reference No. 1210	Remarks safety meeting held
Price of Job	rig up to tubing with hose and valve
Second Stage	pump 5 bbls to clear tubing
Pump Truck Mileage 3825	pump and mix 315 sks type 2/5 cement
P.U. Mileage 765	displace .5 bbl thru mixer
Other Charges	rig down from tubing
Total Charges 5,800.00	wash up in cellar
	good cement to surface

THANK YOU

Cementer Bryan Hammond	Lead Yield 1.38	Lead Wt. 14.6	Lead Water 6.8	SV 76
Helper Daniel Johnson	Tail Yield	Tail Wt.	Lead Water	SV

District Gillette	State Wy
-----------------------------	--------------------

The above job was done under supervision of the owner, operator, or his agent whose signature appears below.

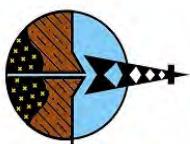
Agent of contractor or operator

Sales Ticket for Materials Only

QUANTITY SACKS	BRAND AND TYPE	PRICE	TOTAL
16	Crew subsistence	500	8,000.00
12	Transportaton of cement	150	1,800.00
			0.00
			0.00
			0.00
	P.O. # 152614		0.00
			0.00
	Expected 16yds=313 sks		0.00
			0.00
Plugs			0.00
			0.00
Equipment # 28983	HRS 1.5	315 Handling & Dumping	2.44 768.60
		Mileage	0.00
84127	1	Sub Total	16,368.60
		Discount	
		Sales Tax	
Signature of operator <i>Bryan</i>		Total	

APPENDIX E

Geophysical Logs



Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER		
WELL ID	I-02		
FIELD	FLORENCE COPPER		
COUNTY	PINAL		
STATE	ARIZONA		
TYPE OF LOGS: E-LOG MORE: NAT. GAMMA			
LOCATION	SEC	TWP	RGE
PERMANENT DATUM	GROUND LEVEL	ABOVE PERM. DATUM	ELEVATION
DATE	11-17-17 / 2-17-18	TYPE FLUID IN HOLE	K.B.
RUN No	1 & 2	MUD WEIGHT	D.F.
TYPE LOG	E-LG - NAT. GAMMA	VISCOSITY	G.L.
DEPTH-DRILLER	1225 FT	LEVEL	
DEPTH-LOGGER	1220 FT	MAX. REC. TEMP.	25.06 DEG. C
BTMLLOGGED INTERVAL	1220 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	M. QUINONES	TOOL STRING/SN	GEOVISTA E-LOG SN 4035
WITNESSED BY	GENO - H&A	LOG TIME:ON SITE/OFF SITE	3:30 AM
RUN	BOREHOLE RECORD		CASING RECORD
NO.	BIT	FROM	TO
1	?	SURFACE	40 FT
2	20 IN.	40 FT	TOTAL DEPTH
3	12 1/4 IN.	500 FT	TOTAL DEPTH
COMMENTS:			

Tool Summary:					
Date	11-17-17 / 2-17-18	Date	11-17-17 / 2-17-18	Date	11-17-17 / 2-17-18
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	GEOVISTA E-LOG	Tool Model	MSI 60MM SONIC
Tool SN	4183 / 4009	Tool SN	4790 / 4035	Tool SN	5050
From	500 FT	From	500 FT	From	500 FT
To	1220 FT	To	1220 FT	To	1220 FT
Recorded By	M. QUINONES	Recorded By	M. QUINONES	Recorded By	M. QUINONES
Truck No	900	Truck No	900	Truck No	900
Operation Check	2-16-18	Operation Check	2-16-18	Operation Check	2-16-18
Calibration Check	2-16-18	Calibration Check	2-16-18	Calibration Check	N/A
Time Logged	3:50 AM	Time Logged	5:00 AM	Time Logged	5:45 AM

Tool Summary:					
Date	11-17-17 / 2-17-18	Date	11-17-17 / 2-17-18	Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI DEVIATION	Tool Model	COMPROBE G-N	Tool Model	
Tool SN	6002	Tool SN	1107	Tool SN	
From	500 FT	From	500 FT	From	
To	1220 FT	To	1220 FT	To	
Recorded By	M. QUINONES	Recorded By	M. QUINONES	Recorded By	
Truck No	900	Truck No	900	Truck No	
Operation Check	2-16-18	Operation Check	2-16-18	Operation Check	
Calibration Check	N/A	Calibration Check	N/A	Calibration Check	
Time Logged	6:50 AM	Time Logged	7:40 AM	Time Logged	

Additional Comments:
 Caliper Arms Used: 15 IN.

Calibration Points: 8 IN. & 23 IN.

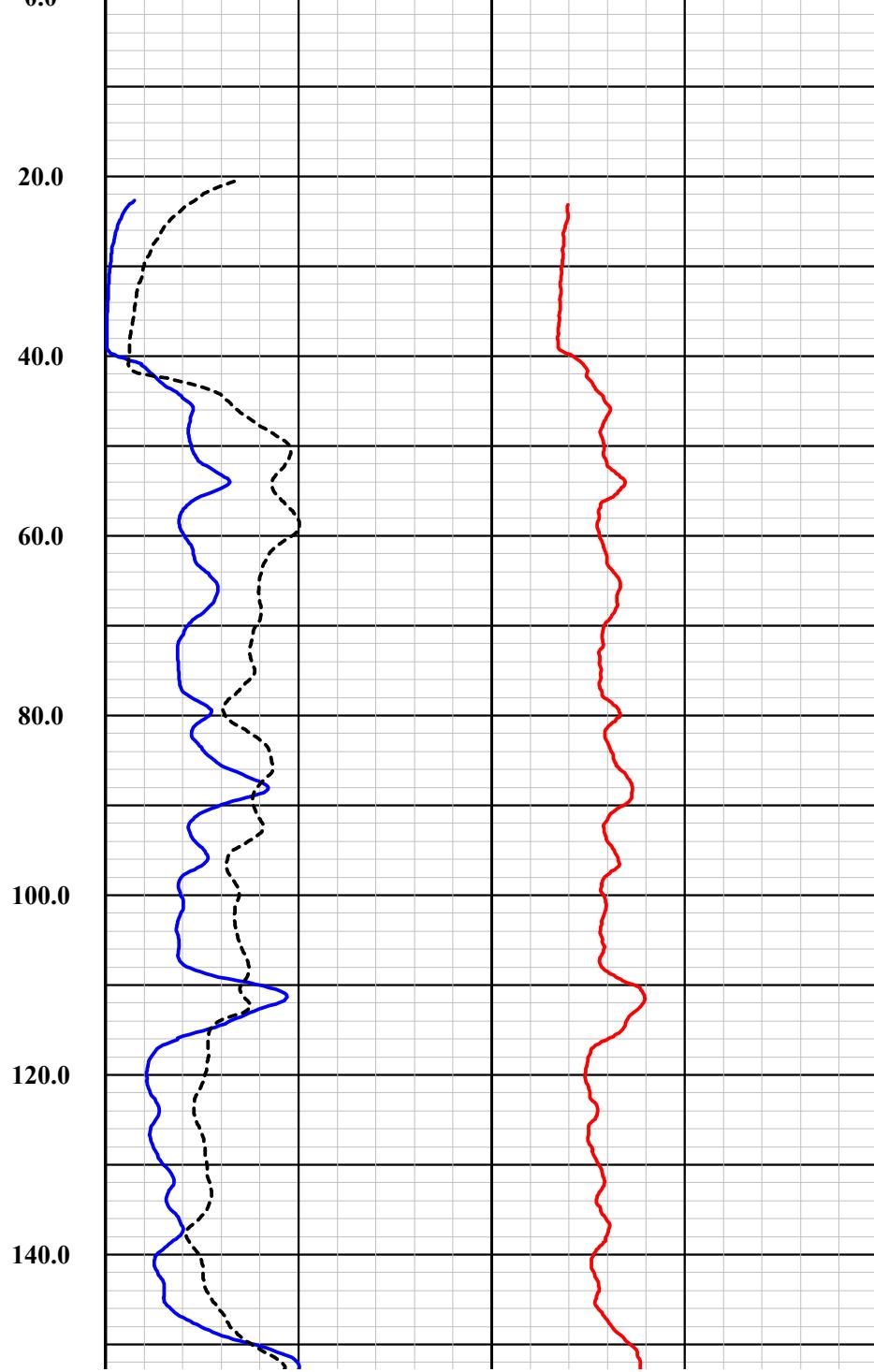
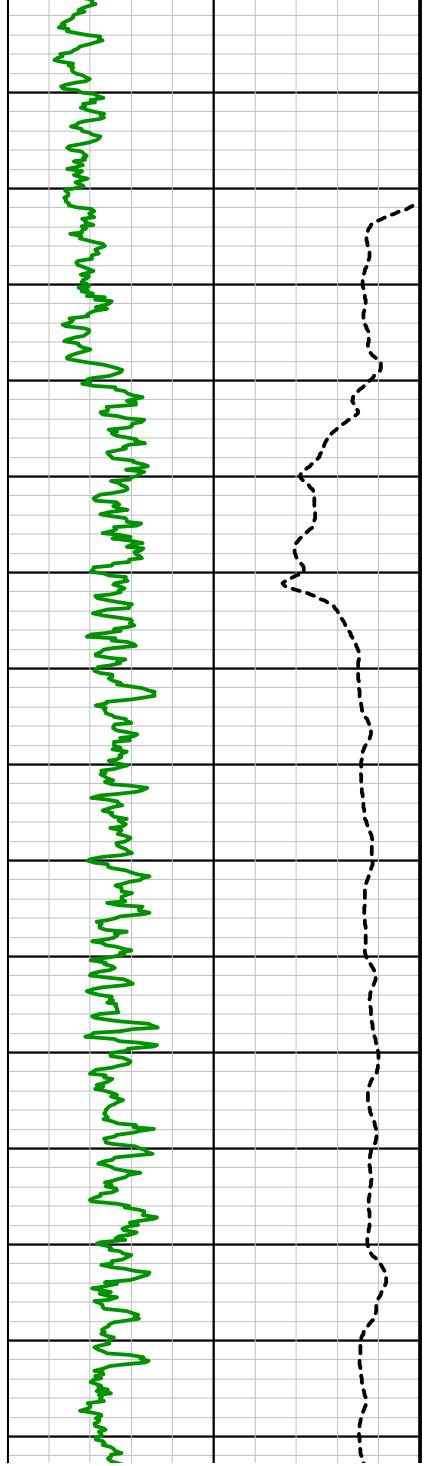
Disclaimer:

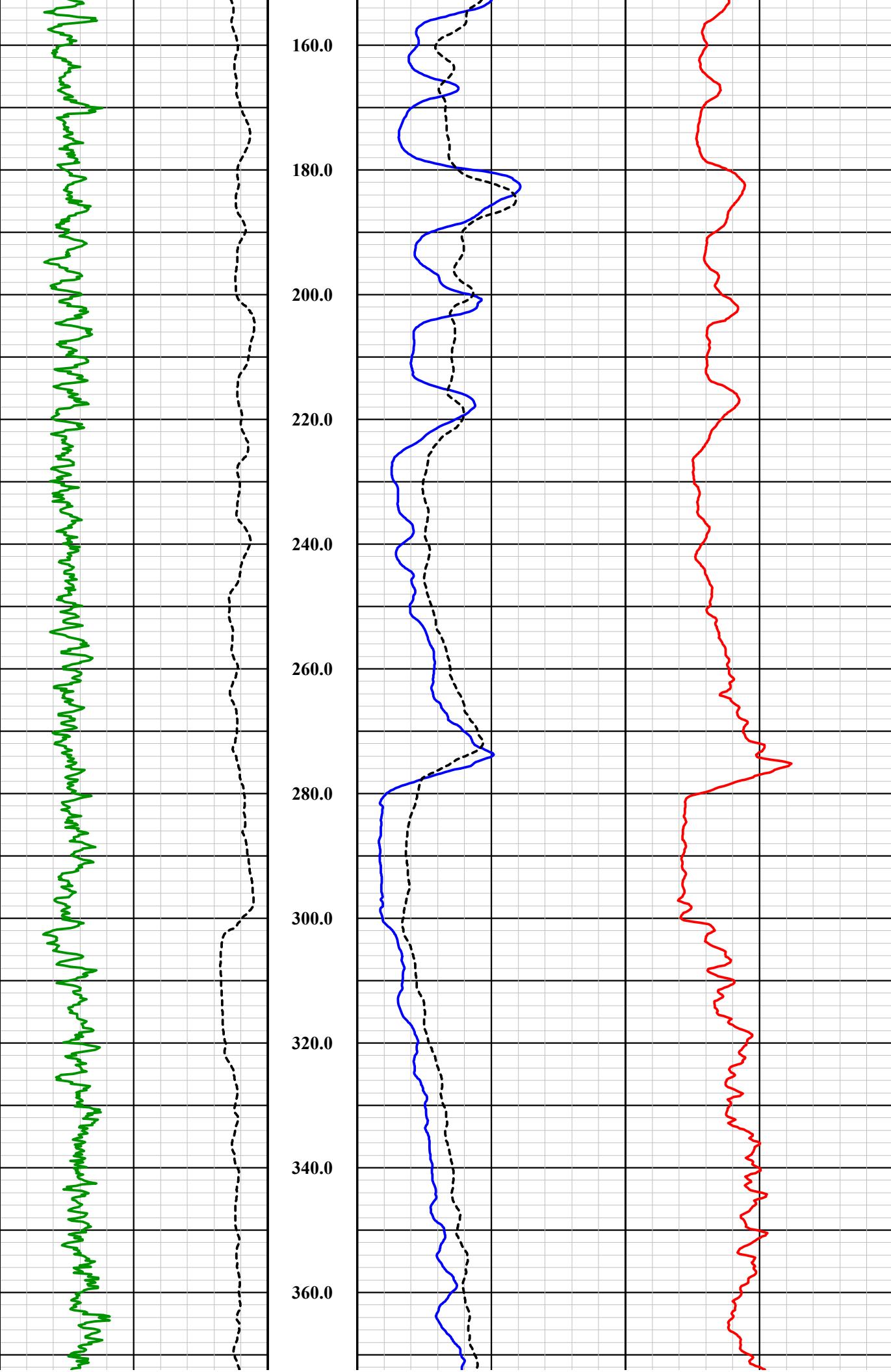
All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

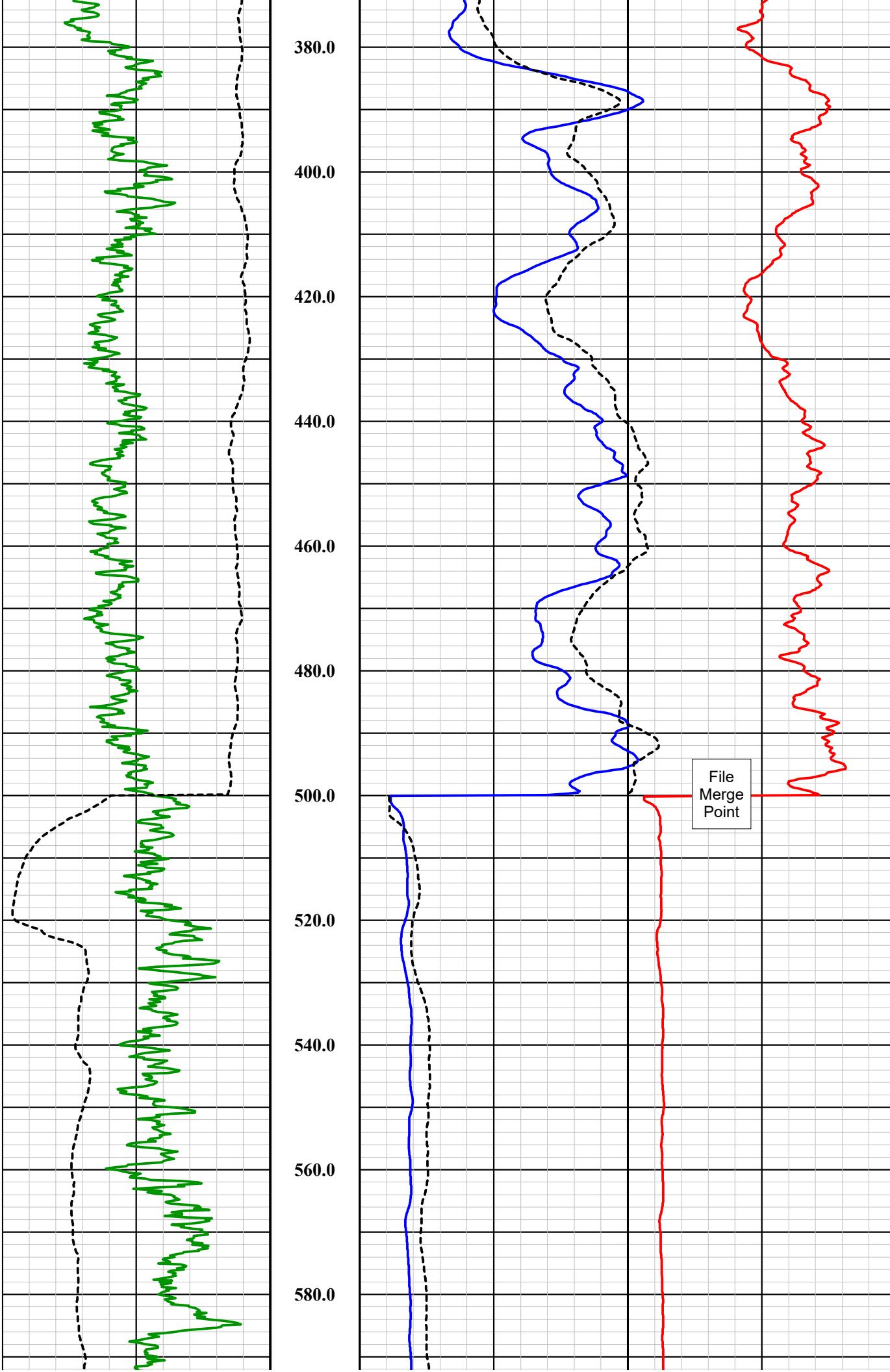
Nat. Gamma		Depth	16" NRes	
0	API	200	0	Ohm-m
-700	mV	600	0	200

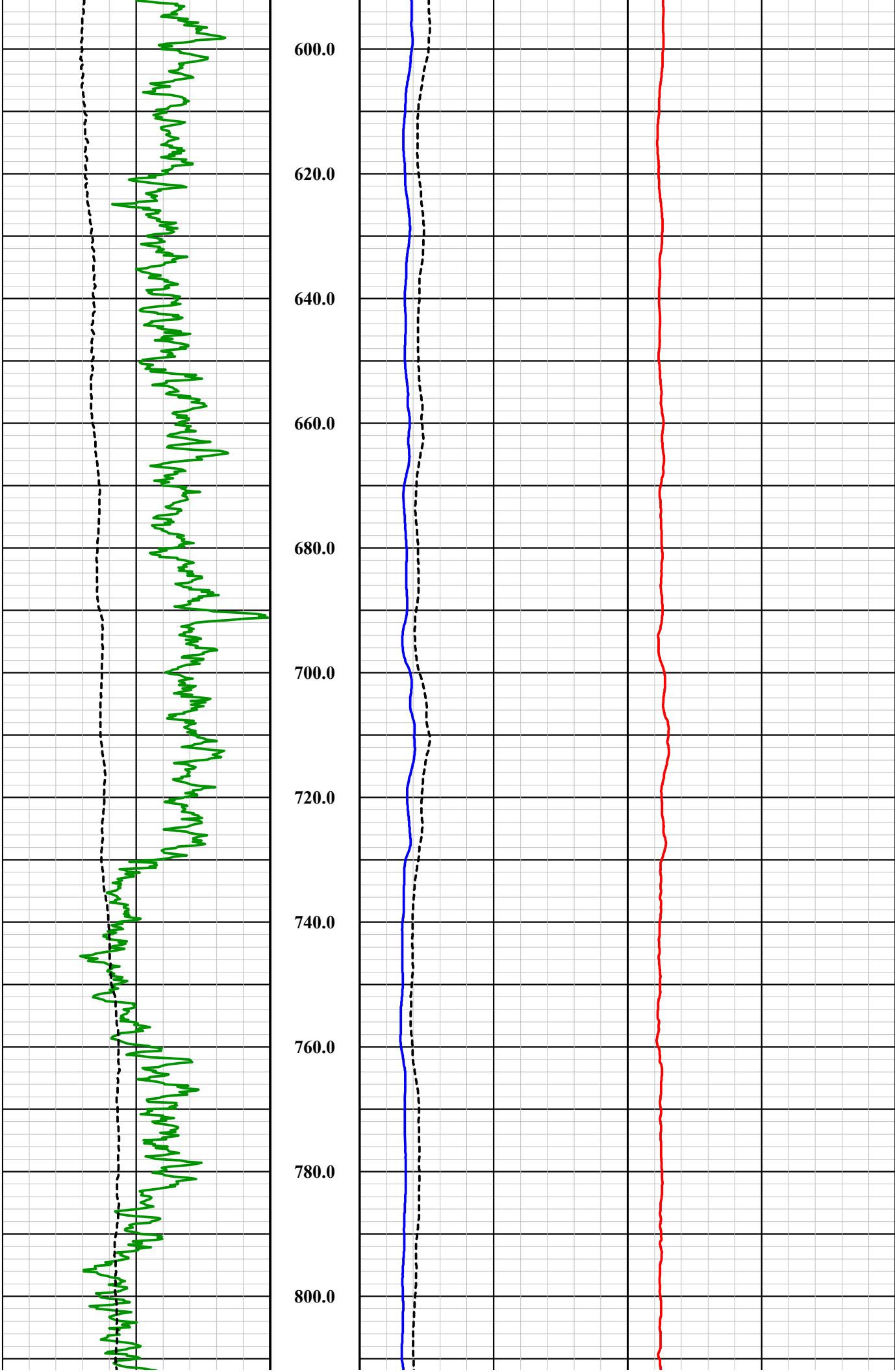
SP		Depth	64" NRes	
-700	mV	600	0	Ohm-m

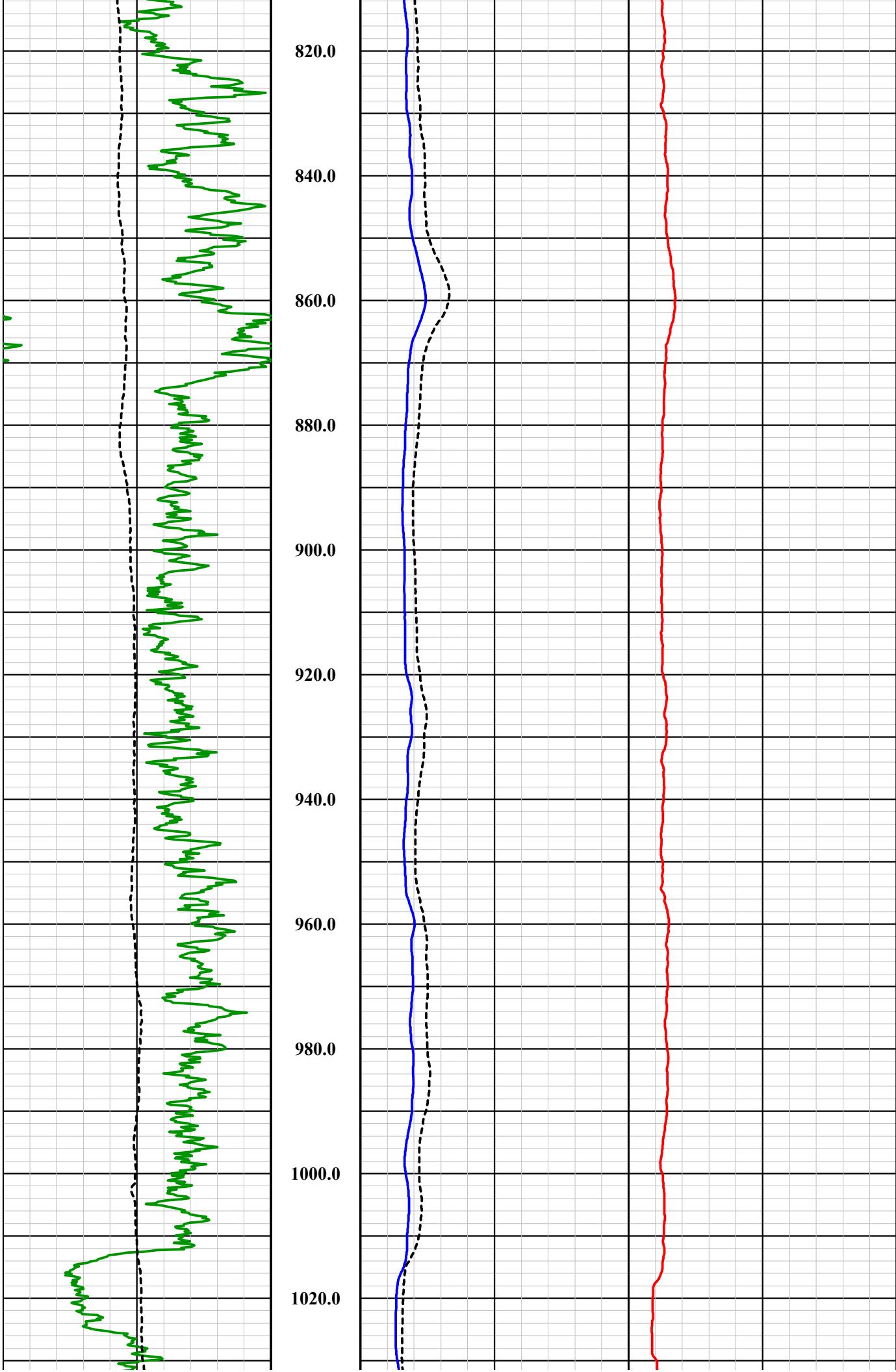
		Depth	SPR	
10	Ohms	40		

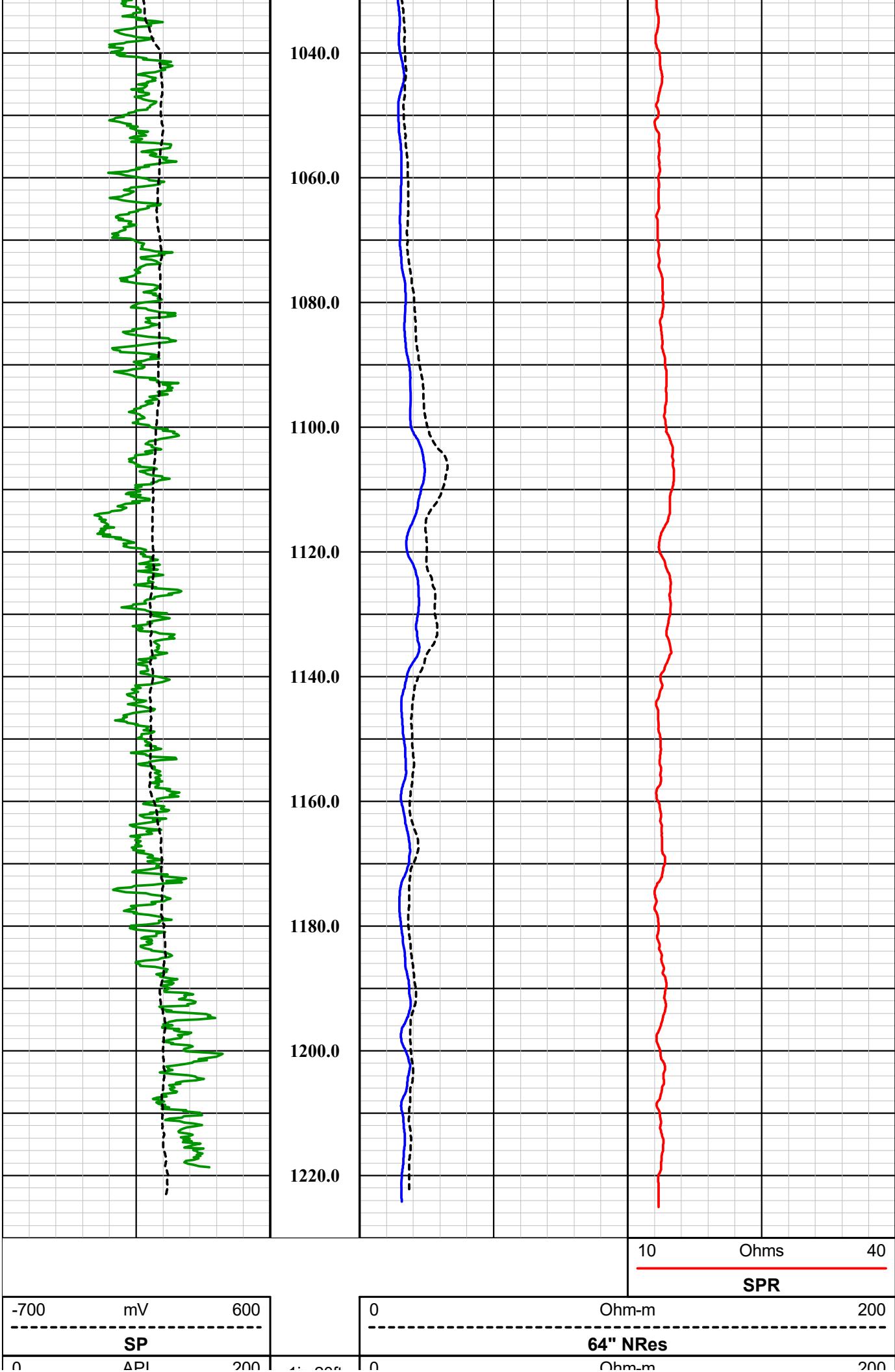












0	API 200	11h:20ft	0	CHINCH	200
Nat. Gamma	Depth			16" NRes	

GeoVista E-Log Tool

Probe Top = Depth Ref.

Tool SN: 4035 & 4790



Bridle connects to wireline cablehead: Wireline armor is the B Electrode.

Four Conductor Probe Top

Bridle Electrode (N Electrode)

64" Normal Resistivity Electrode/Spontaneous Potential Electrode (M Electrode)

Probe Length = 2.3 m or 7.55 ft

Bridle Length = 10.0 m or 32.81 ft

Probe Weight = 7.0 kg or 15.4 lbs

Can only be collected in fluid

Isolation Bridle - Not shown in diagram but is necessary for operation

Electrode Measuring Points (from bottom of probe)

Spontaneous Potential (SP): 0.65 m or 2.13 ft

16" Normal Resistivity (16" NRes): 0.50 m or 1.64 ft

64" Normal Resistivity (64" NRes): 1.10 m or 3.61 ft

Single Point Resistance (SPR): 0.25 m or 0.82 ft

Temperature Rating: 80 Deg C (176 Deg F)

Pressure Rating: 200 bar (2900 psi)

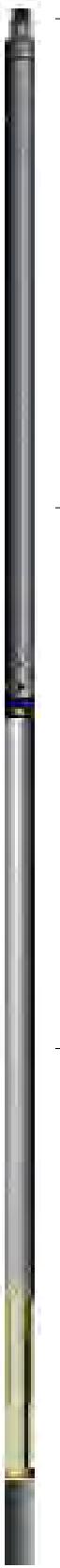
16" Normal Resistivity Electrode (M Electrode)

Current Electrode/Single Point Resistance (A Electrode)

 1.65" or 42 mm Diameter

MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter



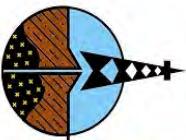
**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company	FLORENCE COPPER
Well	I-02
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final

E-Log Summary



Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER		
WELL ID	I-02		
FIELD	FLORENCE COPPER		
COUNTY	PINAL		
STATE	ARIZONA		
TYPE OF LOGS: GAMMA - NEUTRON			
MORE: 3-ARM CALIPER			
LOCATION	OTHER SERVICES E-LOG SONIC DEVIATION TEMPERATURE FLUID RESISTIVITY	SEC	TWP
DRILLING MEAS. FROM GROUND LEVEL	ELEVATION ABOVE PERM. DATUM	RGE	K.B. D.F. G.L.
DATE	11-17-17	TYPE FLUID IN HOLE MUD WEIGHT	MUD N/A
RUN No	1 & 5	VISCOSITY	N/A
TYPE LOG	GAMMA - NEUTRON	LEVEL	FULL
DEPTH-DRILLER	506 FT.	MAX. REC. TEMP.	22.58 DEG. C
DEPTH-LOGGER	500 FT.	IMAGE ORIENTED TO:	N/A
BTMLLOGGED INTERVAL	500 FT.	SAMPLE INTERVAL	0.2 FT.
TOP LOGGED INTERVAL	SURFACE	LOGGING TRUCK	TRUCK #900
DRILLER / RIG#	HYDRO RESOURCES	TOOL STRING/SN	COMPROBE G-N SN 1107
RECORDED BY / Logging Eng.	A. OLSON / M. QUINONES	LOG TIME:ON SITE/OFF SITE	12:00 P.M.
WITNESSED BY	COLLIN - H&A		
RUN	BOREHOLE RECORD		CASING RECORD
NO.	BIT	FROM	TO
1	?	SURFACE	40 FT.
2	20IN.	TOTAL DEPTH	
3			
COMMENTS:			

Tool Summary:					
Date	11-17-17	Date	11-17-17	Date	11-17-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	GEOVISTA E-LOG	Tool Model	MSI 60MM SONIC
Tool SN	4183	Tool SN	4790	Tool SN	5001
From	SURFACE	From	SURFACE	From	SURFACE
To	500 FT.	To	500 FT.	To	500 FT.
Recorded By	A. OLSON	Recorded By	A. OLSON	Recorded By	A. OLSON
Truck No	900	Truck No	900	Truck No	900
Operation Check	11-16-17	Operation Check	11-16-17	Operation Check	11-16-17
Calibration Check	11-16-17	Calibration Check	11-16-17	Calibration Check	N/A
Time Logged	12:20 P.M.	Time Logged	12:55 P.M.	Time Logged	1:20 P.M.

Date	11-17-17	Date	11-17-17	Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI DEVIATION	Tool Model	COMPROBE G-N	Tool Model	
Tool SN	6002	Tool SN	1107	Tool SN	
From	SURFACE	From	SURFACE	From	
To	500 FT.	To	500 FT.	To	
Recorded By	A. OLSON	Recorded By	A. OLSON	Recorded By	
Truck No	900	Truck No	900	Truck No	
Operation Check	11-13-17	Operation Check	11-13-17	Operation Check	
Calibration Check	N/A	Calibration Check	N/A	Calibration Check	
Time Logged	1:45 P.M.	Time Logged	2:30 P.M.	Time Logged	

Additional Comments:		Caliper Arms Used:	15 IN.	Calibration Points:	8 IN. & 23 IN.
1	2	3	4	5	6

E-Log Calibration Range: 10-1000 OHM-M

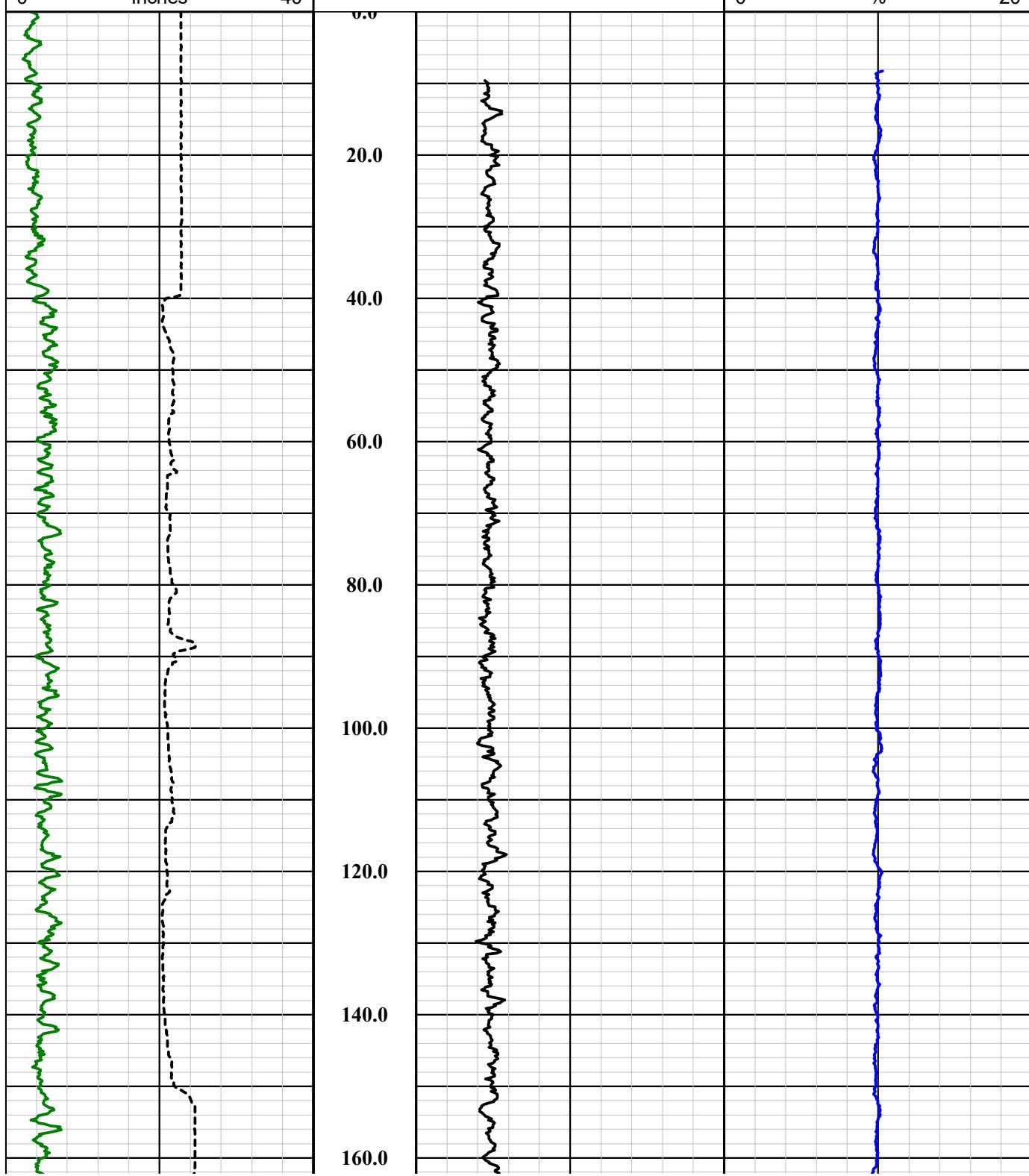
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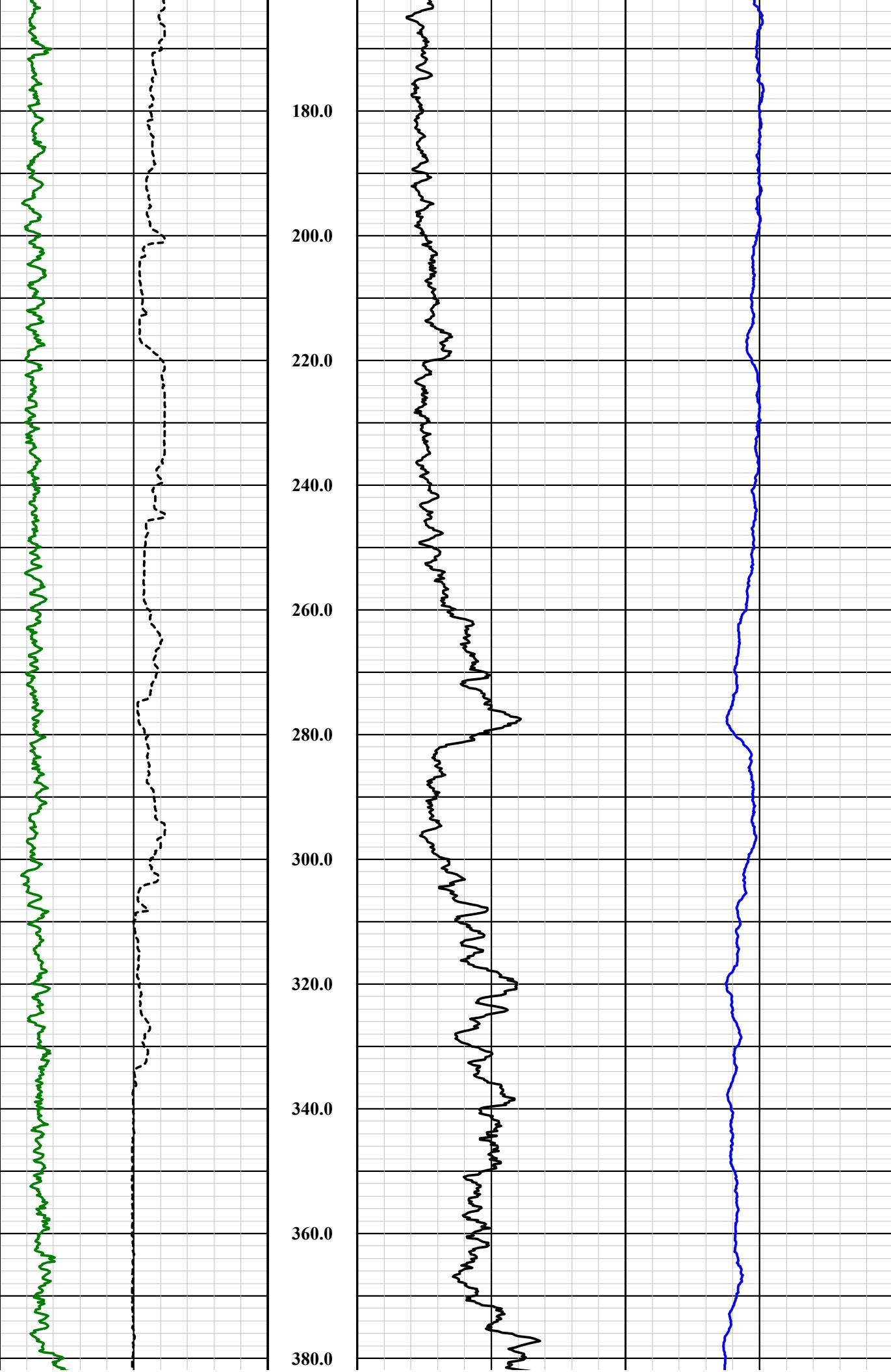
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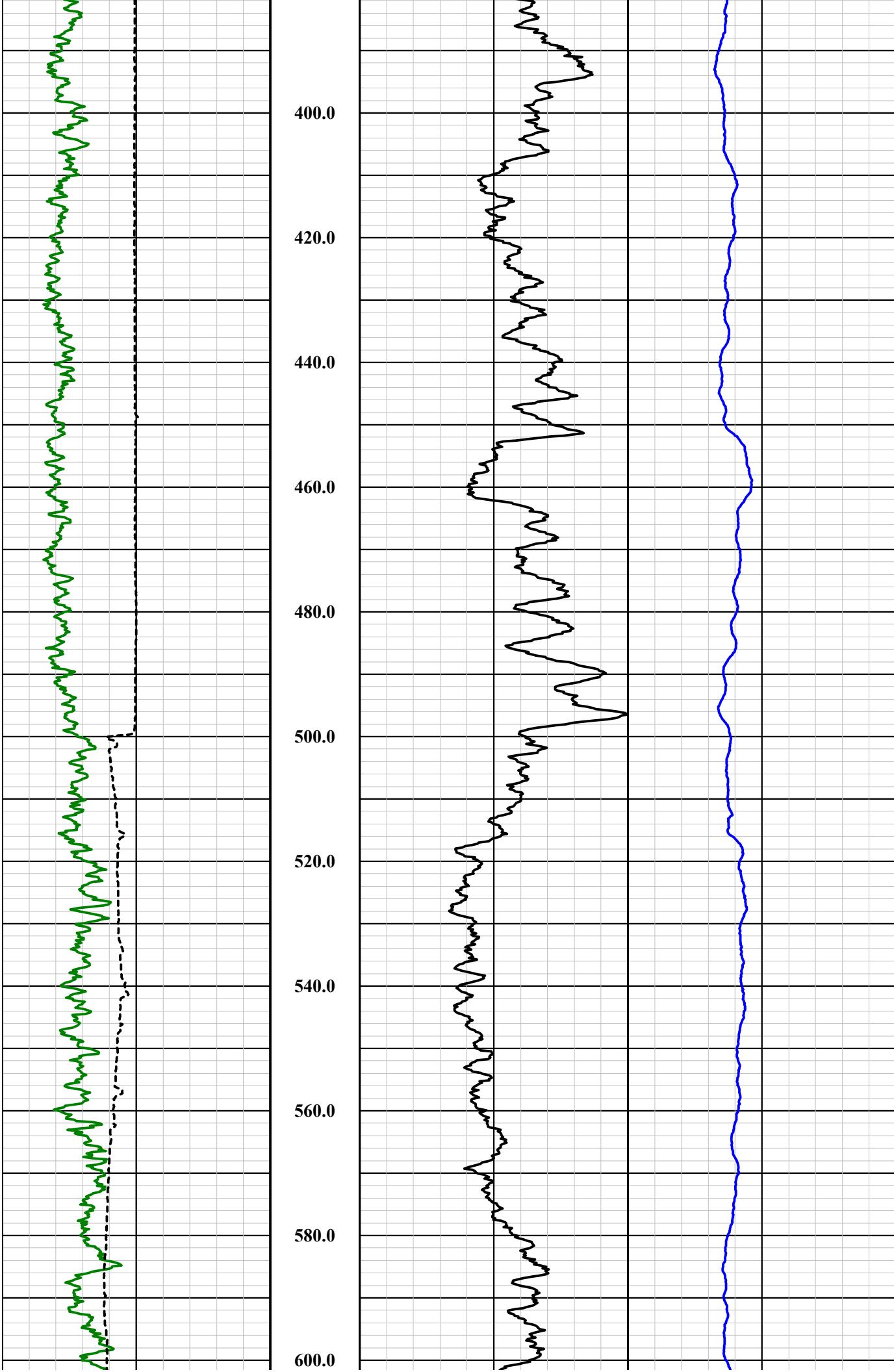
All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

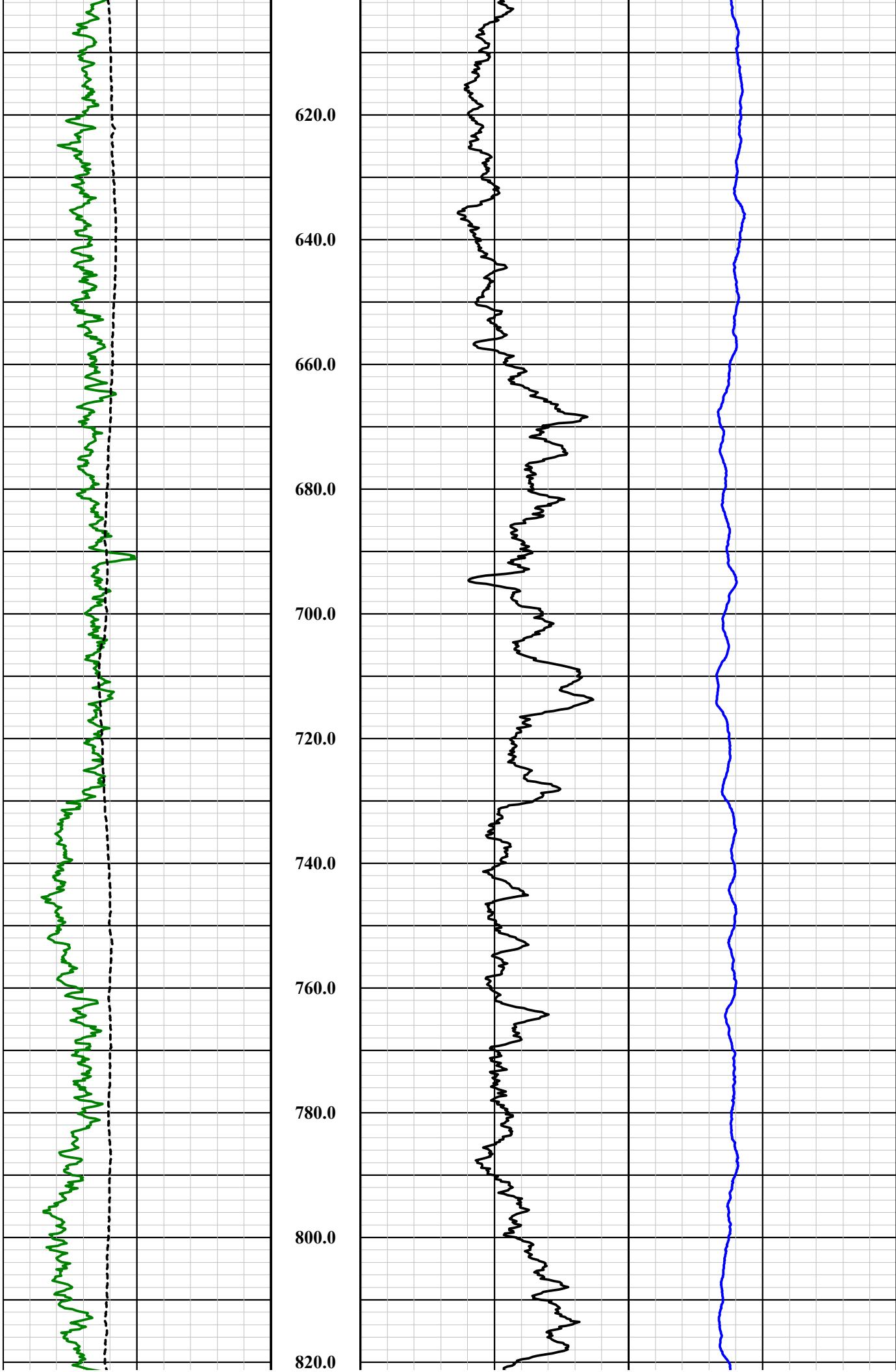
Nat. Gamma		Depth	Neutron	
0	API	1in:20ft	0	2000

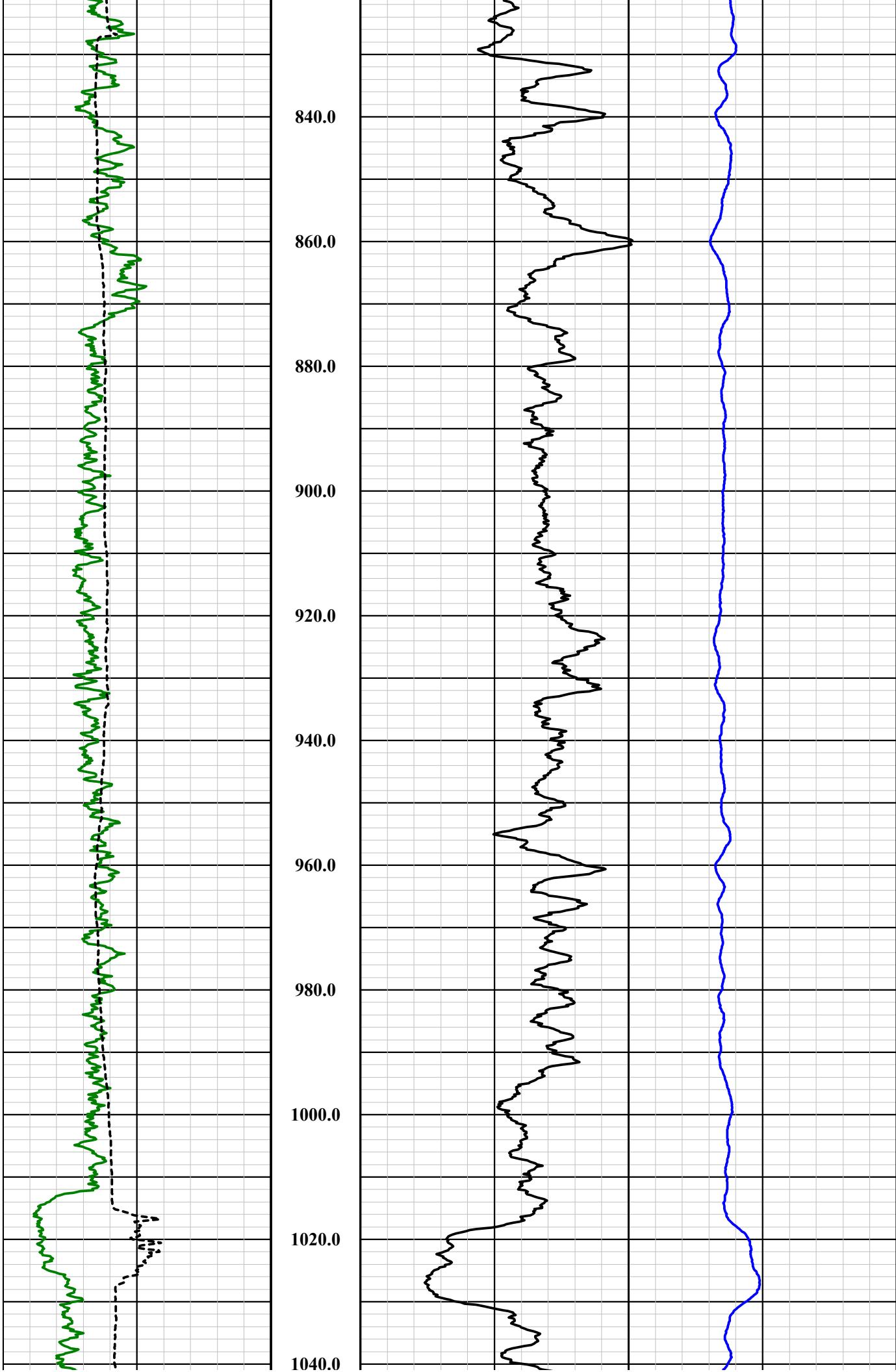
3-Arm Caliper			Neutron Porosity	
0	Inches	40	0	20

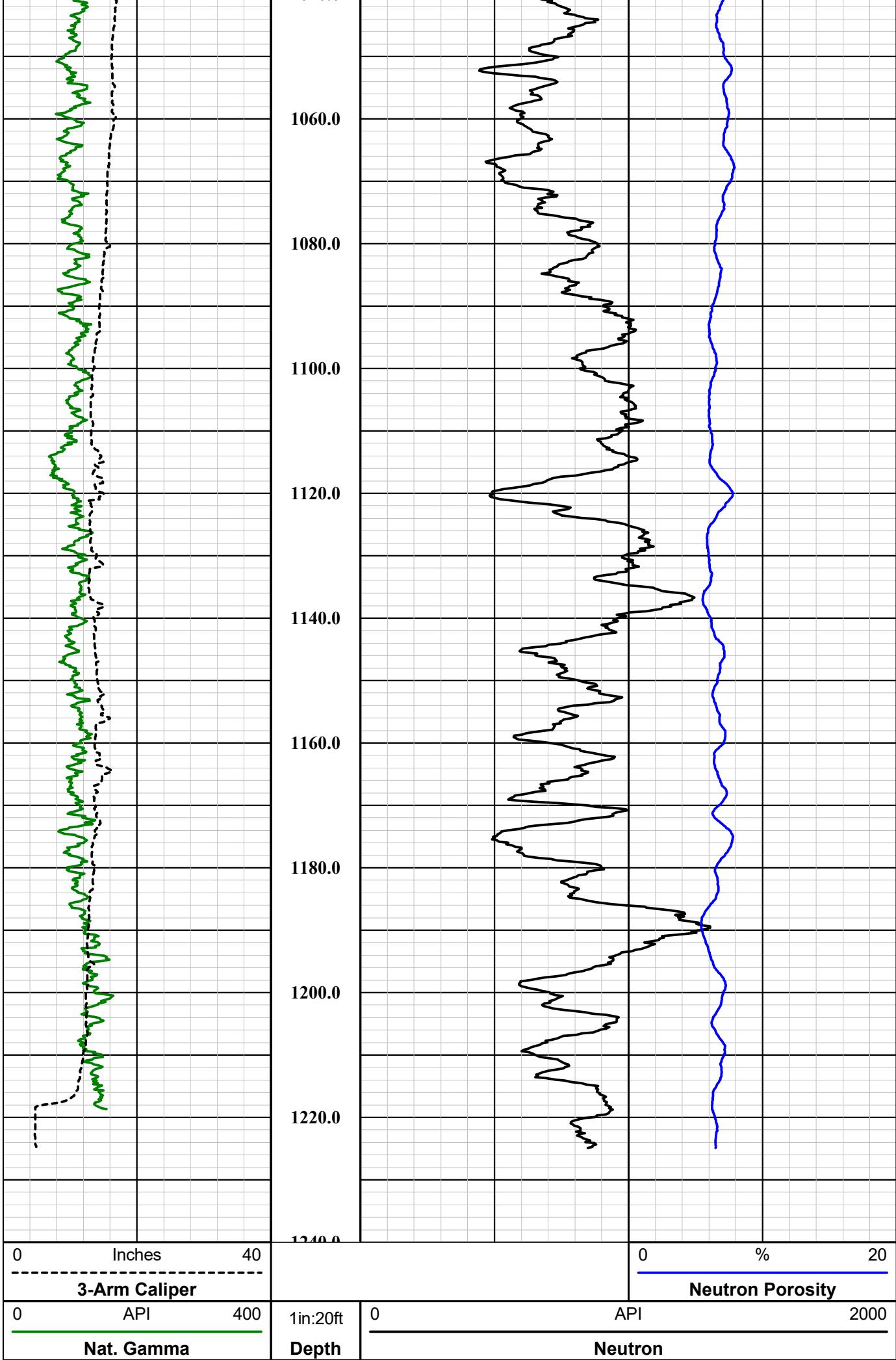












Comprobe Gamma-Neutron

Probe Top = Depth Ref.

Tool SN: 1107 & 3555



Four Conductor Probe Top

Probe Length = 2.82 m or 9.25 ft

Probe Weight = 18.1 kg or 40.14 lbs

Gamma Detector = 0.66 m (26 in)

Temperature Rating: 148.9 Deg C (300 Deg F)

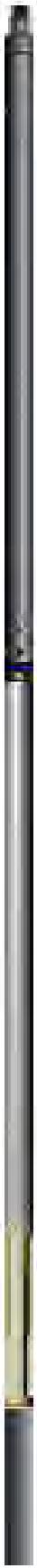
Pressure Rating: 689.5 bar (10,000 psi)

Neutron Detector = 2.61 m (102.8 in)

Source

MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TEP (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter



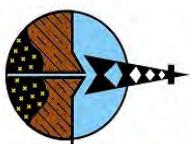
**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company	FLORENCE COPPER
Well	I-02
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final

Gamma - Neutron Summary



Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER		
WELL ID	I-02		
FIELD	FLORENCE COPPER		
COUNTY	PINAL		
STATE	ARIZONA		
TYPE OF LOGS: GAMMA - CALIPER			
MORE: TEMP. / FLUID RES.			
LOCATION			
SEC	TWP	RGE	ELEVATION
PERMANENT DATUM	GROUND LEVEL	ABOVE PERM. DATUM	K.B. D.F. G.L.
DATE	11-17-17 / 2-17-18	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	GAMMA-CALIPER-TFR	VISCOSITY	N/A
DEPTH-DRILLER	1225 FT	LEVEL	FULL
DEPTH-LOGGER	1220 FT	MAX. REC. TEMP.	25.06 DEG. C
BTM LOGGED INTERVAL	1220 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	M. QUINONES	TOOL STRING/SN	MSI COMBO TOOL SN 4009
WITNESSED BY	GENO - H&A	LOG TIME:ON SITE/OFF SITE	3:30 AM
RUN	BOREHOLE RECORD		CASING RECORD
NO.	BIT	FROM	TO
1	?	SURFACE	40 FT
2	20 IN.	40 FT	TOTAL DEPTH
3	12 1/4 IN.	500 FT	TOTAL DEPTH
COMMENTS:			

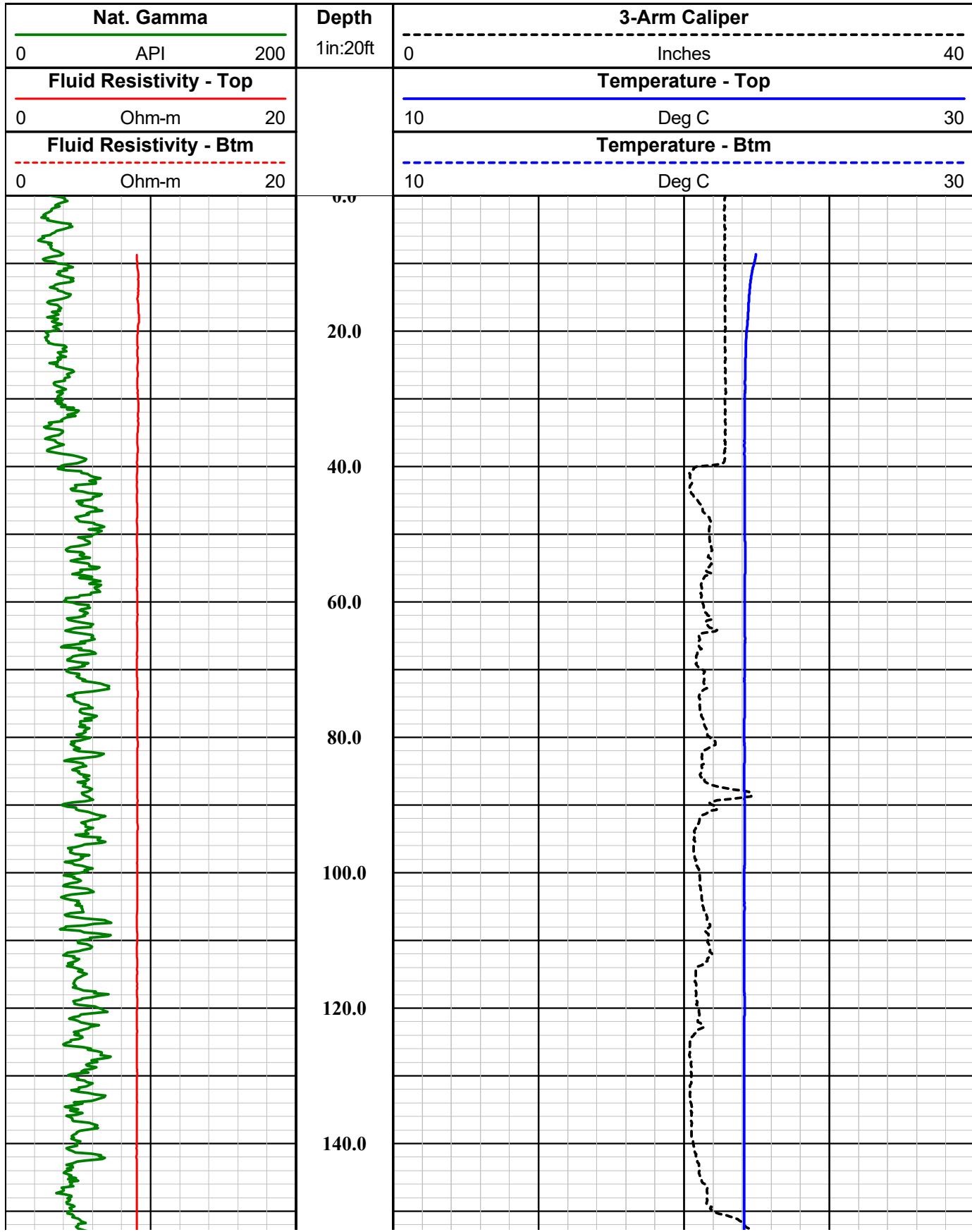
Tool Summary:					
Date	11-17-17 / 2-17-18	Date	11-17-17 / 2-17-18	Date	11-17-17 / 2-17-18
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	GEOVISTA E-LOG	Tool Model	MSI 60MM SONIC
Tool SN	4183 / 4009	Tool SN	4790 / 4035	Tool SN	5050
From	SURFACE	From	SURFACE	From	SURFACE
To	1220 FT	To	1220 FT	To	1220 FT
Recorded By	M. QUINONES	Recorded By	M. QUINONES	Recorded By	M. QUINONES
Truck No	900	Truck No	900	Truck No	900
Operation Check	2-16-18	Operation Check	2-16-18	Operation Check	2-16-18
Calibration Check	2-16-18	Calibration Check	2-16-18	Calibration Check	N/A
Time Logged	3:50 AM	Time Logged	5:00 AM	Time Logged	5:45 AM

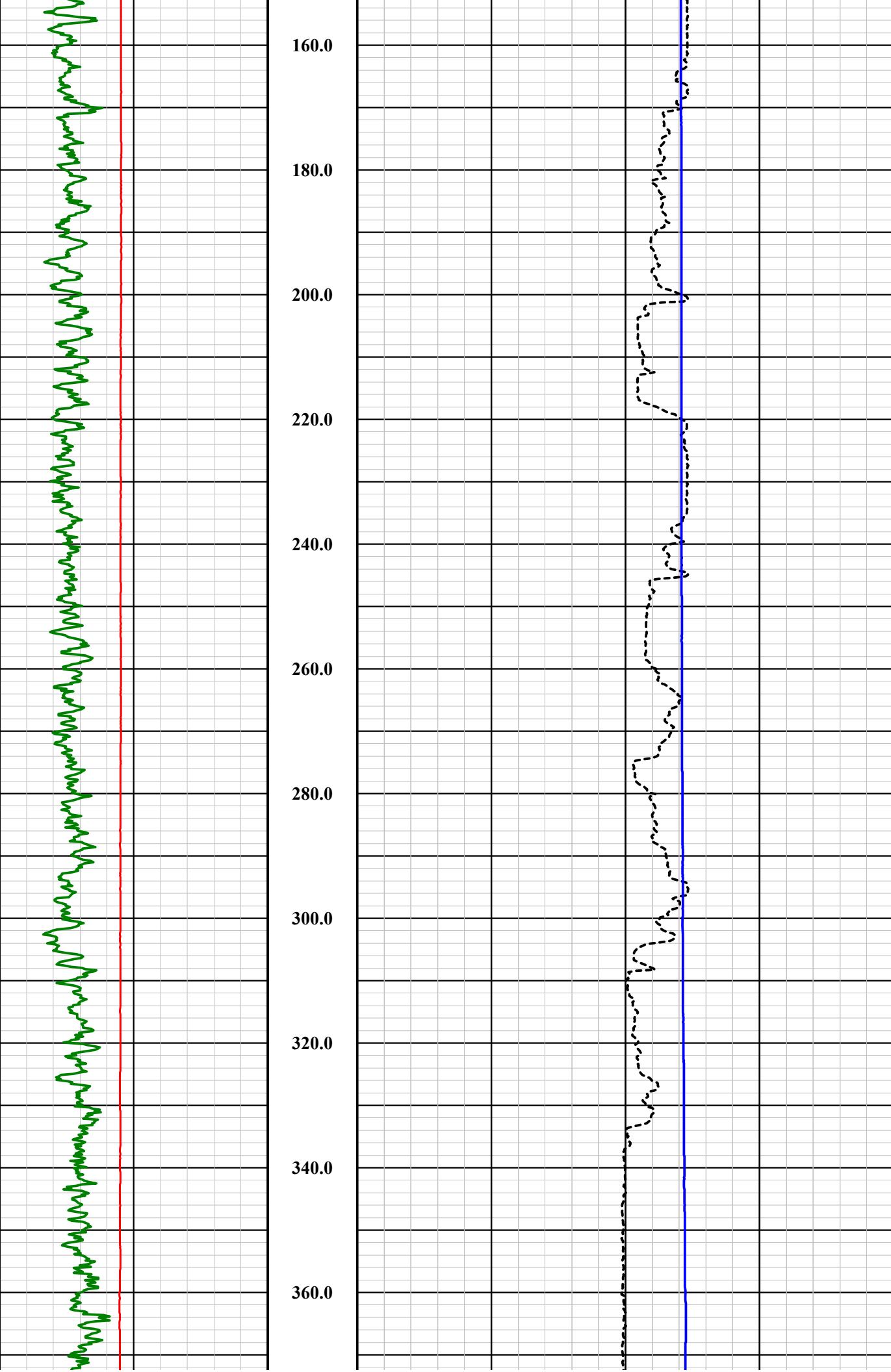
Date	11-17-17 / 2-17-18	Date	11-17-17 / 2-17-18	Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI DEVIATION	Tool Model	COMPROBE G-N	Tool Model	
Tool SN	6002	Tool SN	1107	Tool SN	
From	SURFACE	From	SURFACE	From	
To	1220 FT	To	1220 FT	To	
Recorded By	M. QUINONES	Recorded By	M. QUINONES	Recorded By	
Truck No	900	Truck No	900	Truck No	
Operation Check	2-16-18	Operation Check	2-16-18	Operation Check	
Calibration Check	N/A	Calibration Check	N/A	Calibration Check	
Time Logged	6:50 AM	Time Logged	7:40 AM	Time Logged	

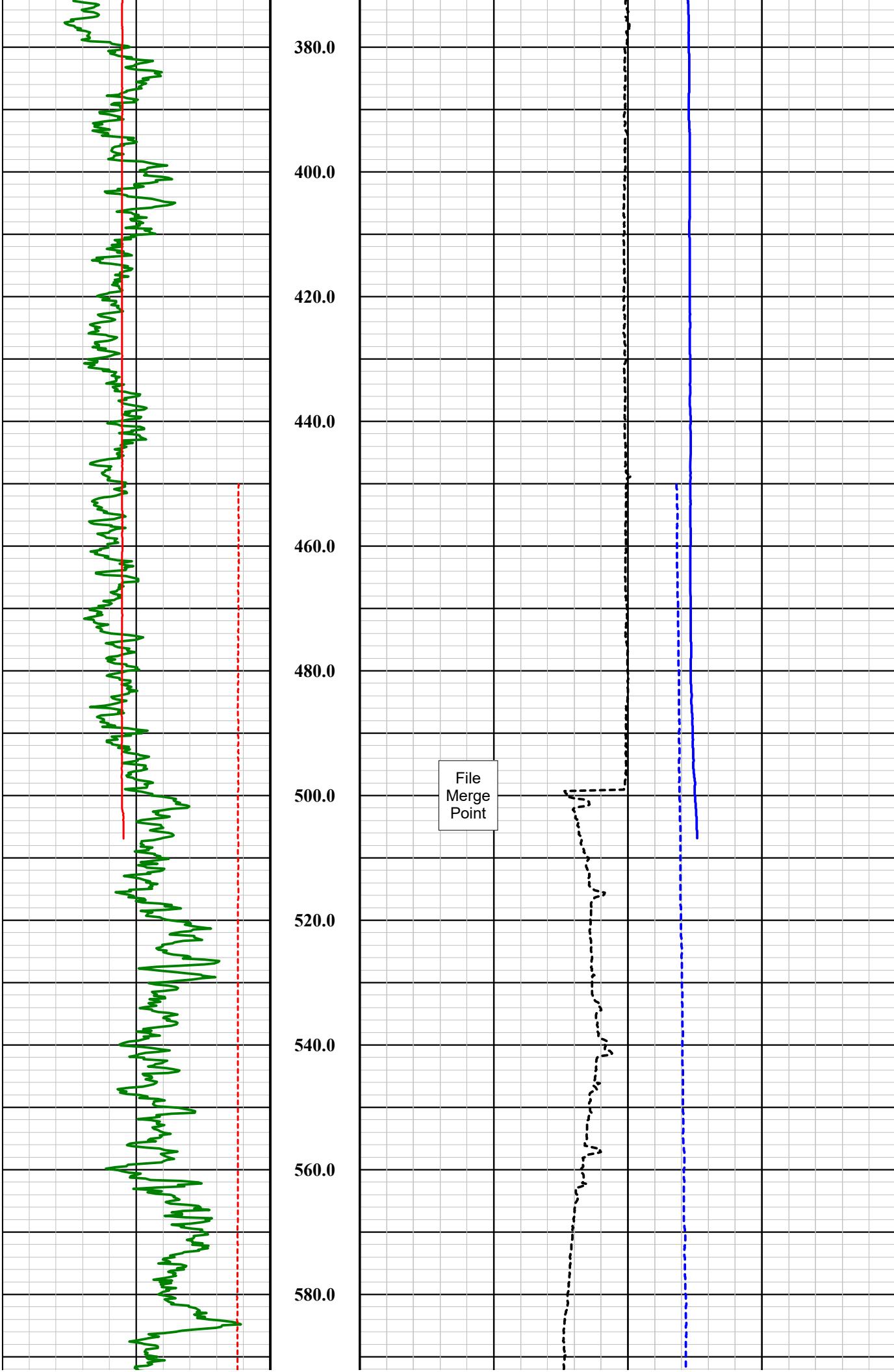
Additional Comments:					
Caliper Arms Used:	15 IN.	Calibration Points:	8 IN. & 23 IN.		
Comments:					

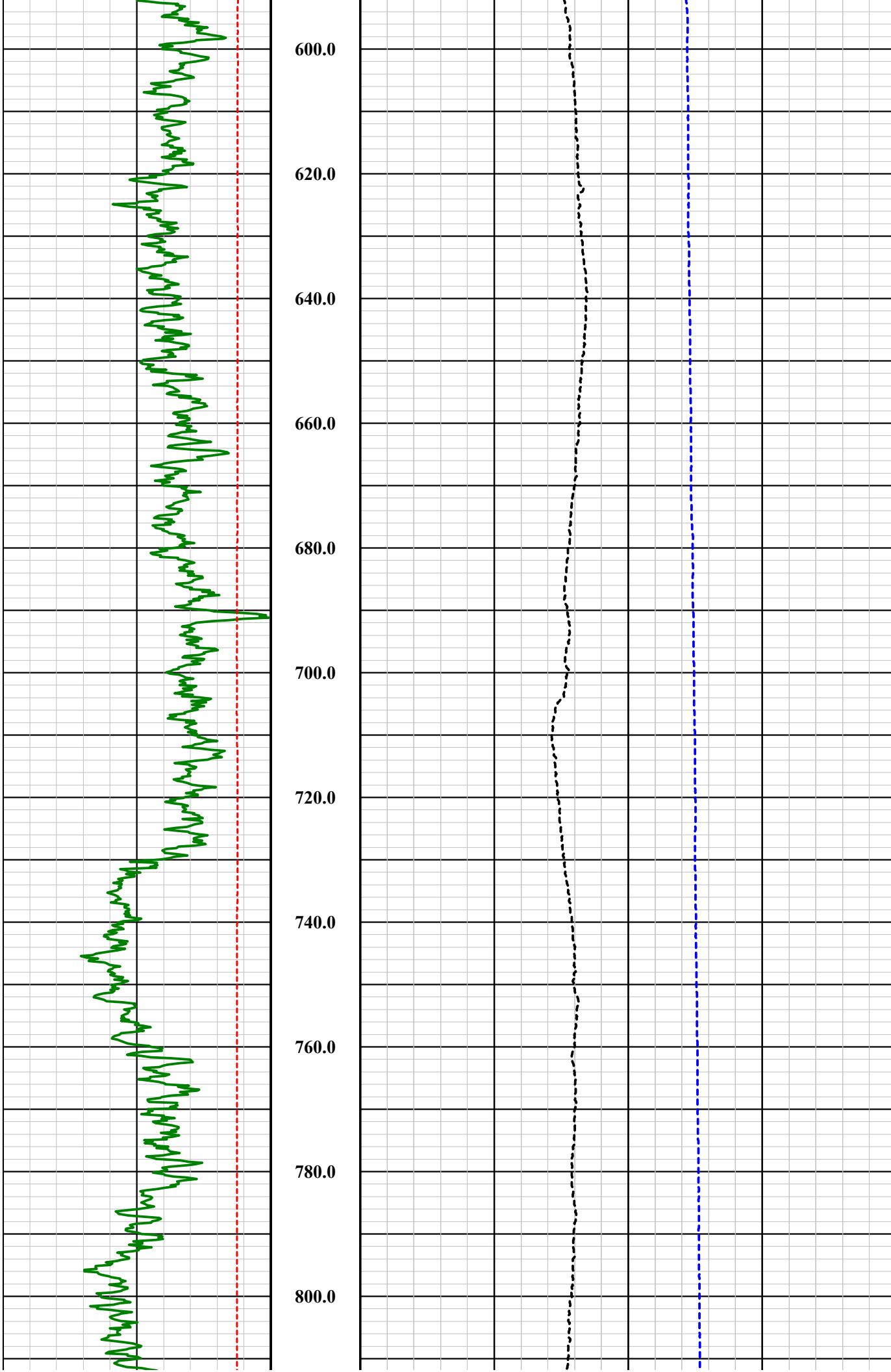
Disclaimer:

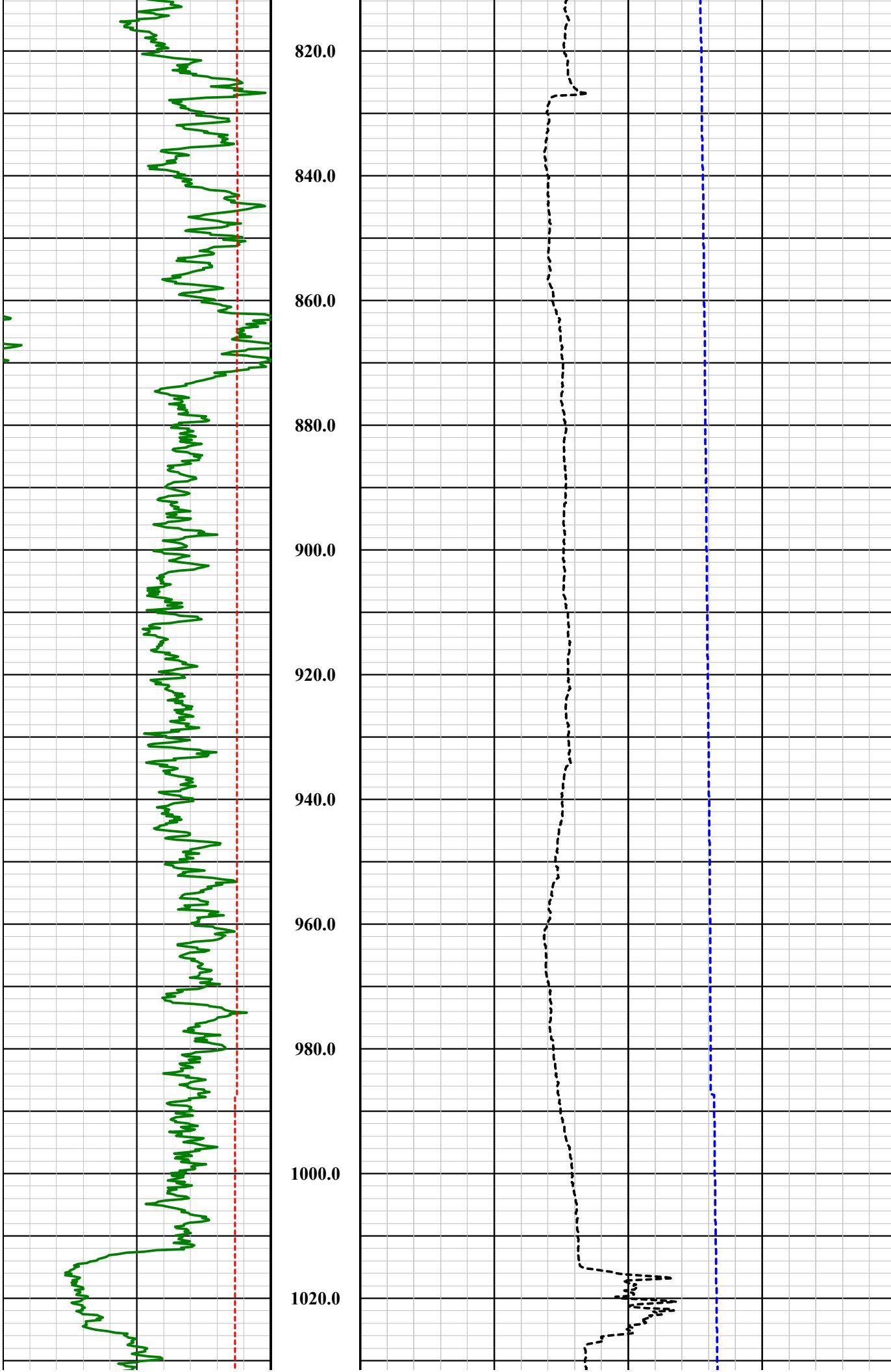
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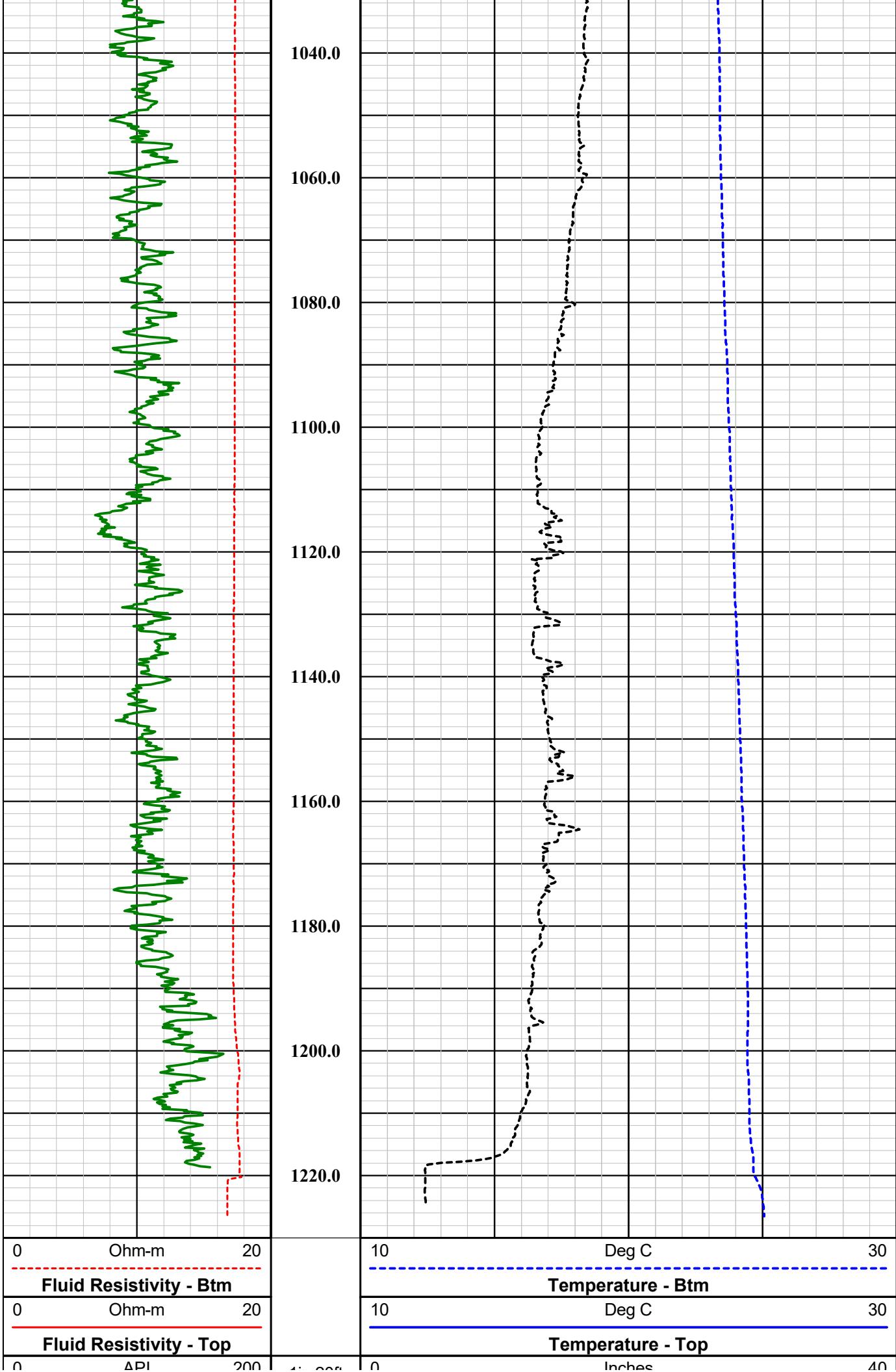












0 Ohm-m 20

Fluid Resistivity - Btm

0 Ohm-m 20

Fluid Resistivity - Top

10 Deg C 30

Temperature - Btm

10 Deg C 30

Temperature - Top

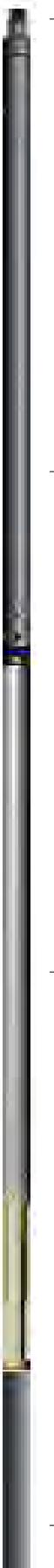
0 API 200

0 Inches 400

0	API 200	1In:20ft	0	inches	40
Nat. Gamma	Depth			3-Arm Caliper	

MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter



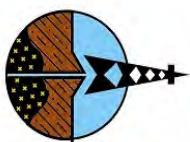
**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company	FLORENCE COPPER
Well	I-02
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final

GCT Summary



Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER		
WELL ID	I-02		
FIELD	FLORENCE COPPER		
COUNTY	PINAL		
STATE	ARIZONA		
TYPE OF LOGS: MSI 60MM SONIC			
MORE: GAMMA - CALIPER			
LOCATION			
SEC	TWP	RGE	ELEVATION
PERMANENT DATUM	GROUND LEVEL	ABOVE PERM. DATUM	K.B.
LOG MEAS. FROM			D.F.
DRILLING MEAS. FROM GROUND LEVEL			G.L.
DATE	11-17-17 / 2-17-18	TYPE FLUID IN HOLE	MUD
RUN No	1 & 4	MUD WEIGHT	N/A
TYPE LOG	SONIC-GAMMA-CALIPER	VISCOSITY	N/A
DEPTH-DRILLER	1225 FT	LEVEL	FULL
DEPTH-LOGGER	1220 FT	MAX. REC. TEMP.	25.06 DEG. C
BTM LOGGED INTERVAL	1220 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.25 FT
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	M. QUINONES	TOOL STRING/SN	MSI 60MM SONIC SN 5050
WITNESSED BY	GENO - H&A	LOG TIME:ON SITE/OFF SITE	3:30 AM
CASING RECORD			
RUN	BOREHOLE RECORD	FROM	TO
NO.	BIT	SIZE	WGT.
1	?	40 FT	24 IN.
2	20 IN.	TOTAL DEPTH	14 IN.
3	12 1/4 IN.	TOTAL DEPTH	500 FT
OTHER SERVICES			
TEMPERATURE			
FLUID RESISTIVITY			
E-LOG			
DEVIATION			
GAMMA-NEUTRON			

Tool Summary:					
Date	11-17-17 / 2-17-18	Date	11-17-17 / 2-17-18	Date	11-17-17 / 2-17-18
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	GEOVISTA E-LOG	Tool Model	MSI 60MM SONIC
Tool SN	4183 / 4009	Tool SN	4790 / 4035	Tool SN	5050
From	500 FT	From	500 FT	From	500 FT
To	1220 FT	To	1220 FT	To	1220 FT
Recorded By	M. QUINONES	Recorded By	M. QUINONES	Recorded By	M. QUINONES
Truck No	900	Truck No	900	Truck No	900
Operation Check	2-16-18	Operation Check	2-16-18	Operation Check	2-16-18
Calibration Check	2-16-18	Calibration Check	2-16-18	Calibration Check	N/A
Time Logged	3:50 AM	Time Logged	5:00 AM	Time Logged	

Date	11-17-17 / 2-17-18	Date	11-17-17 / 2-17-18	Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI DEVIATION	Tool Model	COMPROBE G-N	Tool Model	
Tool SN	6002	Tool SN	1107	Tool SN	
From	500 FT	From	500 FT	From	
To	1220 FT	To	1220 FT	To	
Recorded By	M. QUINONES	Recorded By	M. QUINONES	Recorded By	
Truck No	900	Truck No	900	Truck No	
Operation Check	2-16-18	Operation Check	2-16-18	Operation Check	
Calibration Check	N/A	Calibration Check	N/A	Calibration Check	
Time Logged	6:50 AM	Time Logged	7:40 AM	Time Logged	

Additional Comments:

Caliper Arms Used: 15 IN.

Calibration Points: 8 IN. & 23 IN.

Comments: .

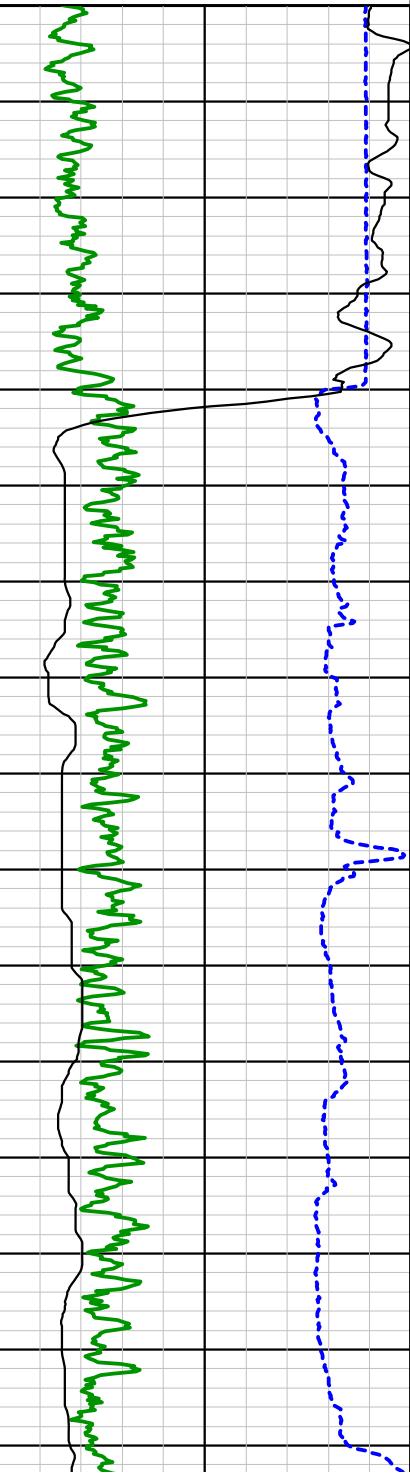
Disclaimer:

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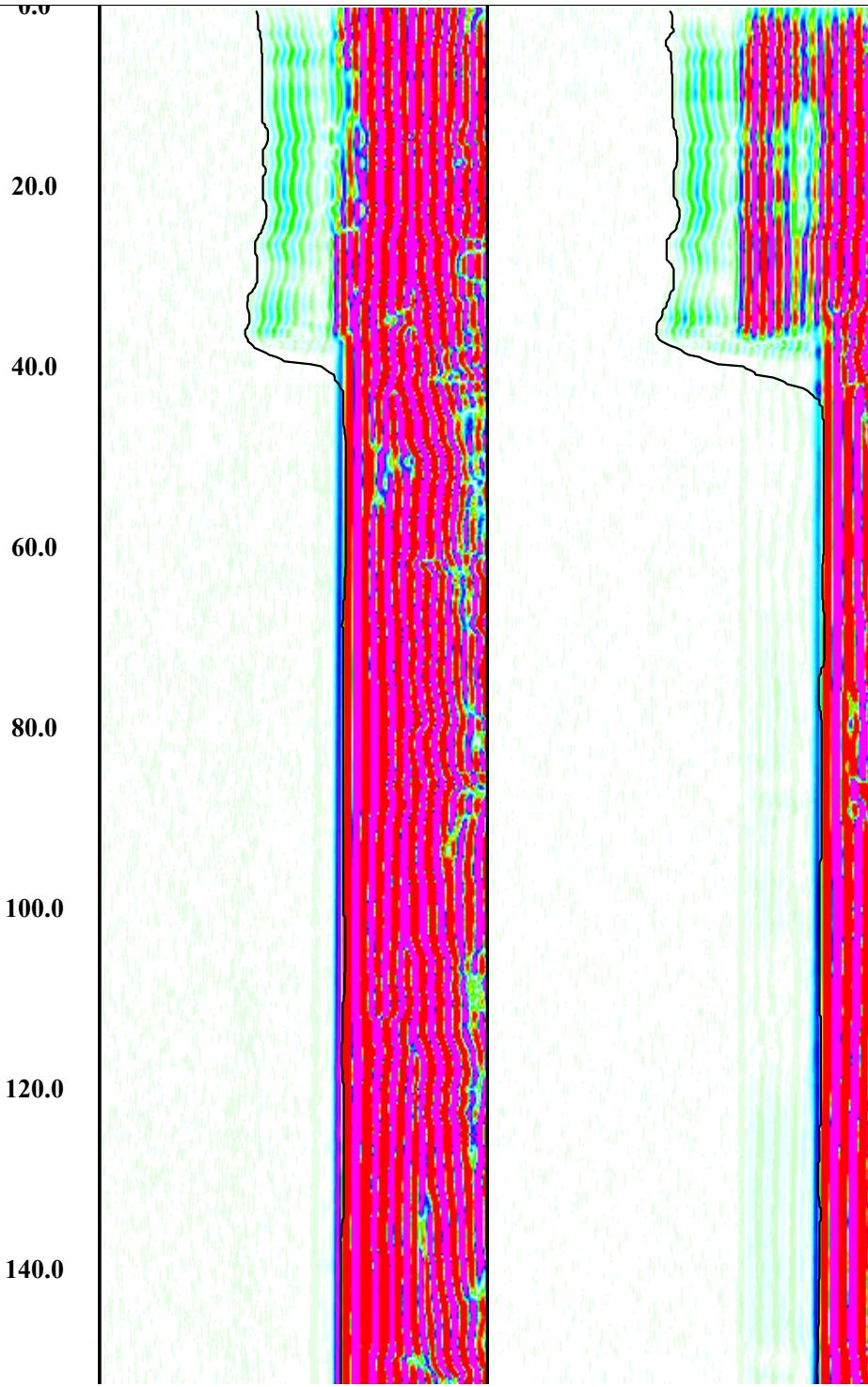
Nat. Gamma	Depth	RX1 - VDL	RX2 - VDL
0 API 200	1in:20ft	100 uSec 1000	100 uSec 1000

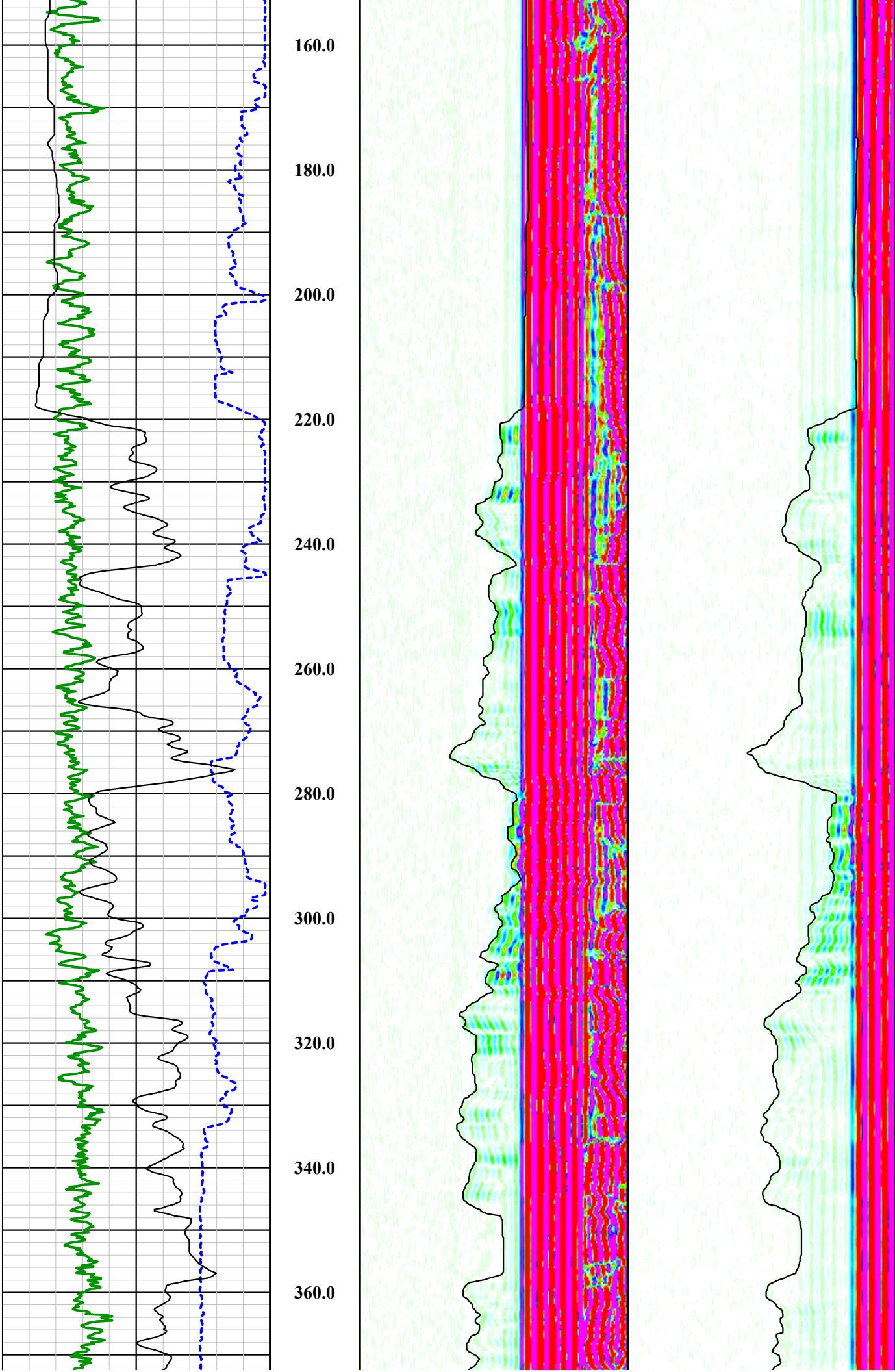
3-Arm Caliper
5 Inches 25

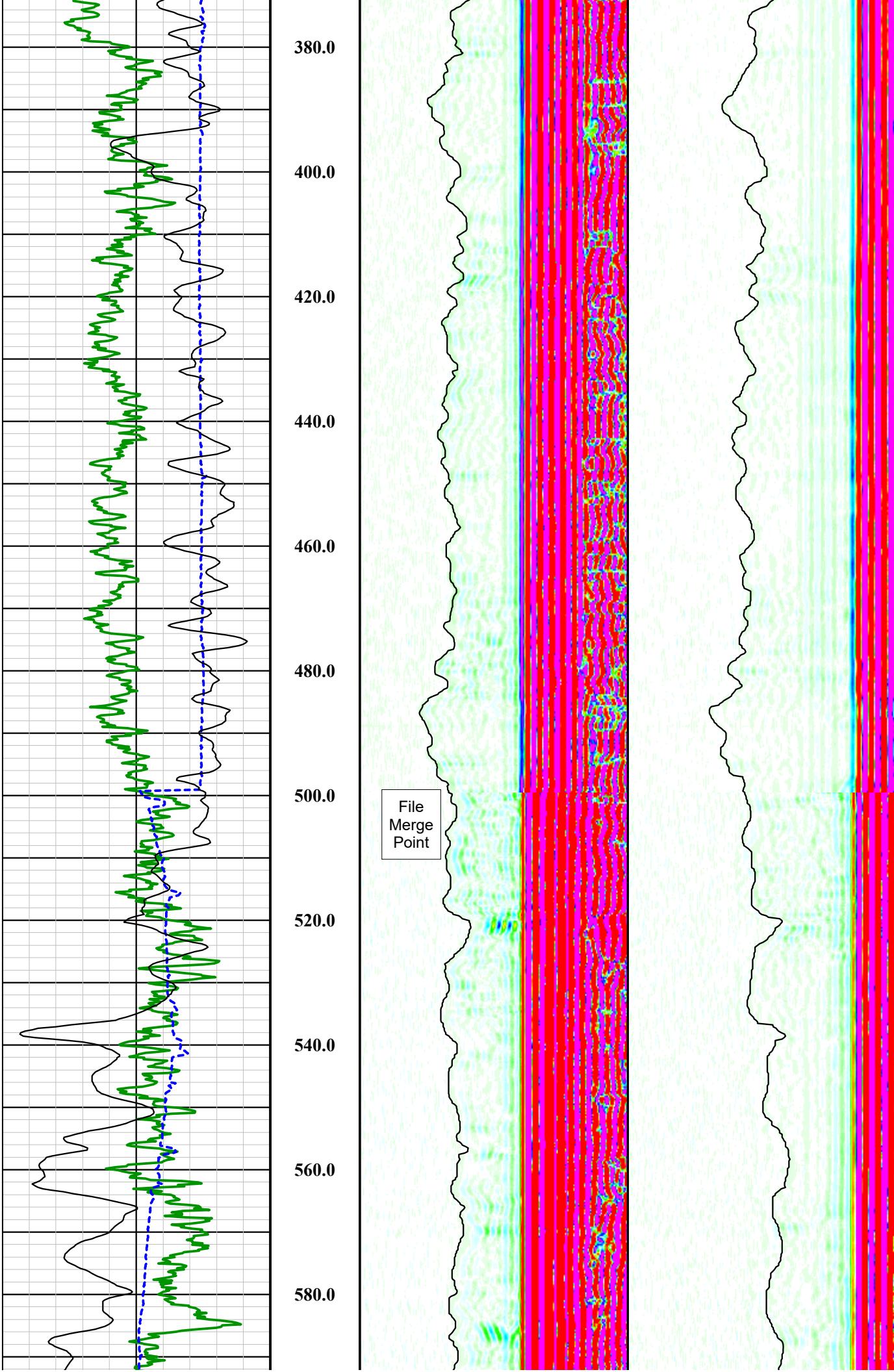
Delta T
240 uSec/ft 40

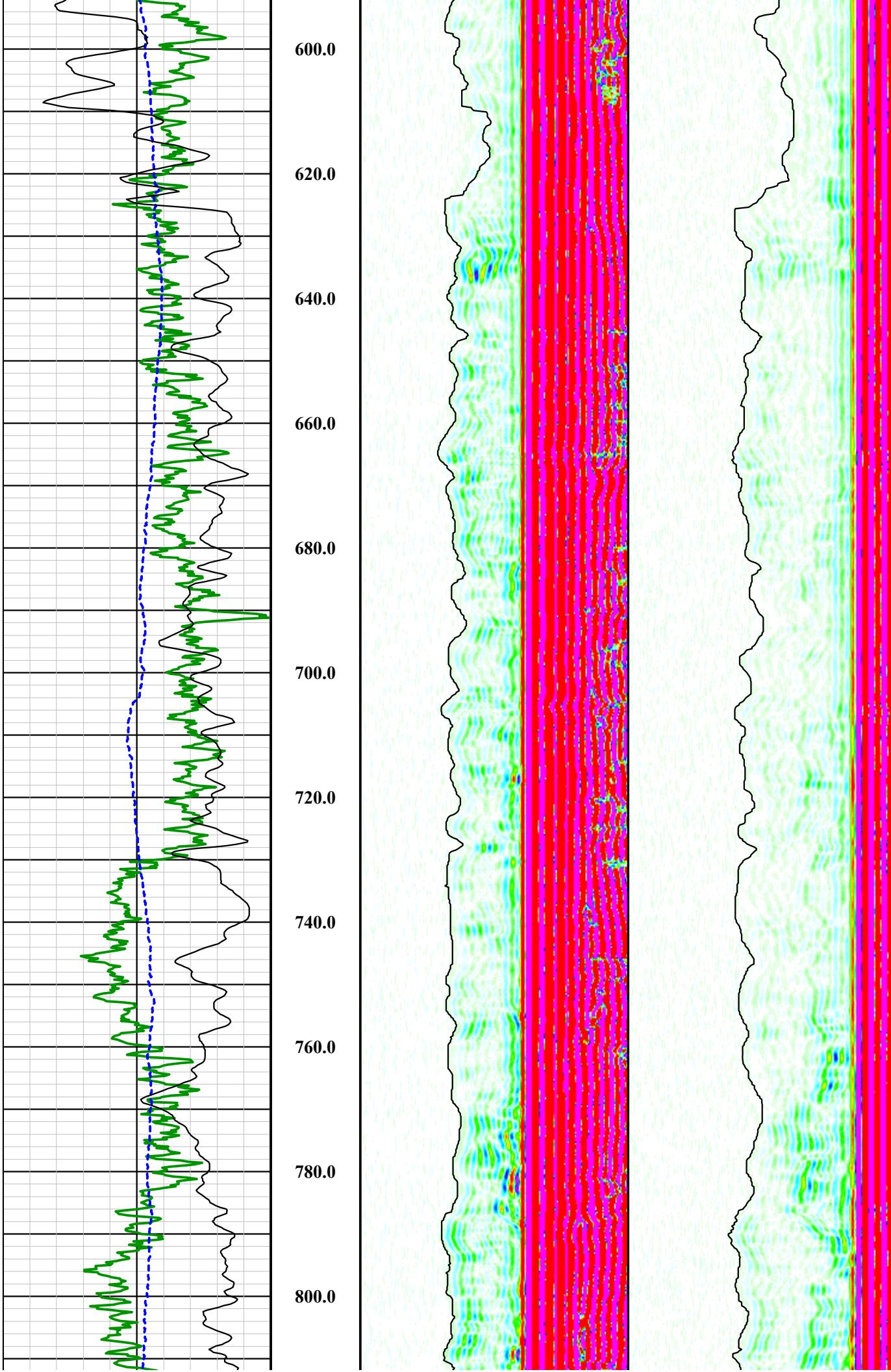


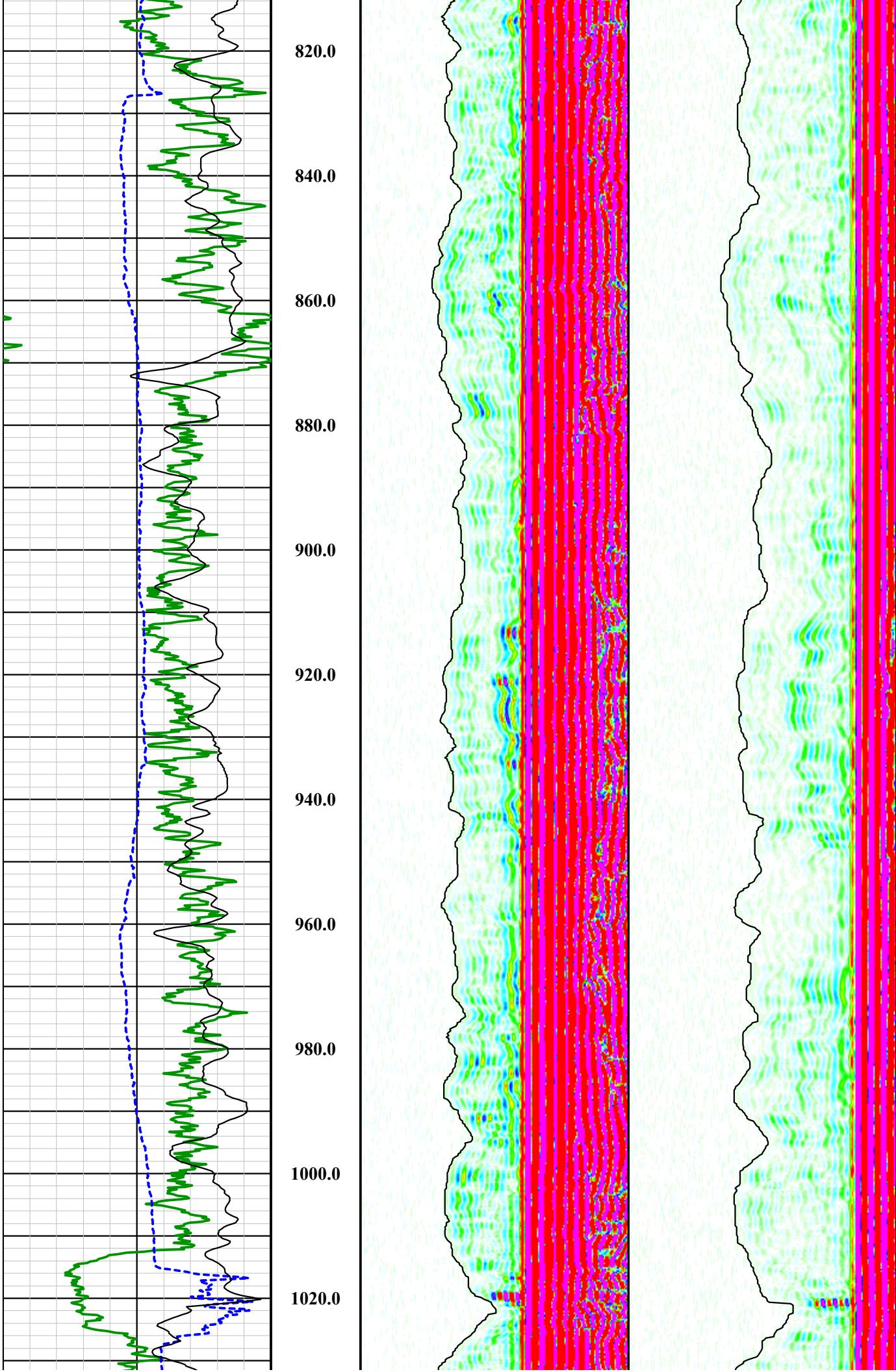
Depth	RX1 - VDL	RX2 - VDL
1in:20ft	100 uSec 1000	100 uSec 1000
RX1 - Travel Time	RX2 - Travel Time	
100 uSec 1000	100 uSec 1000	

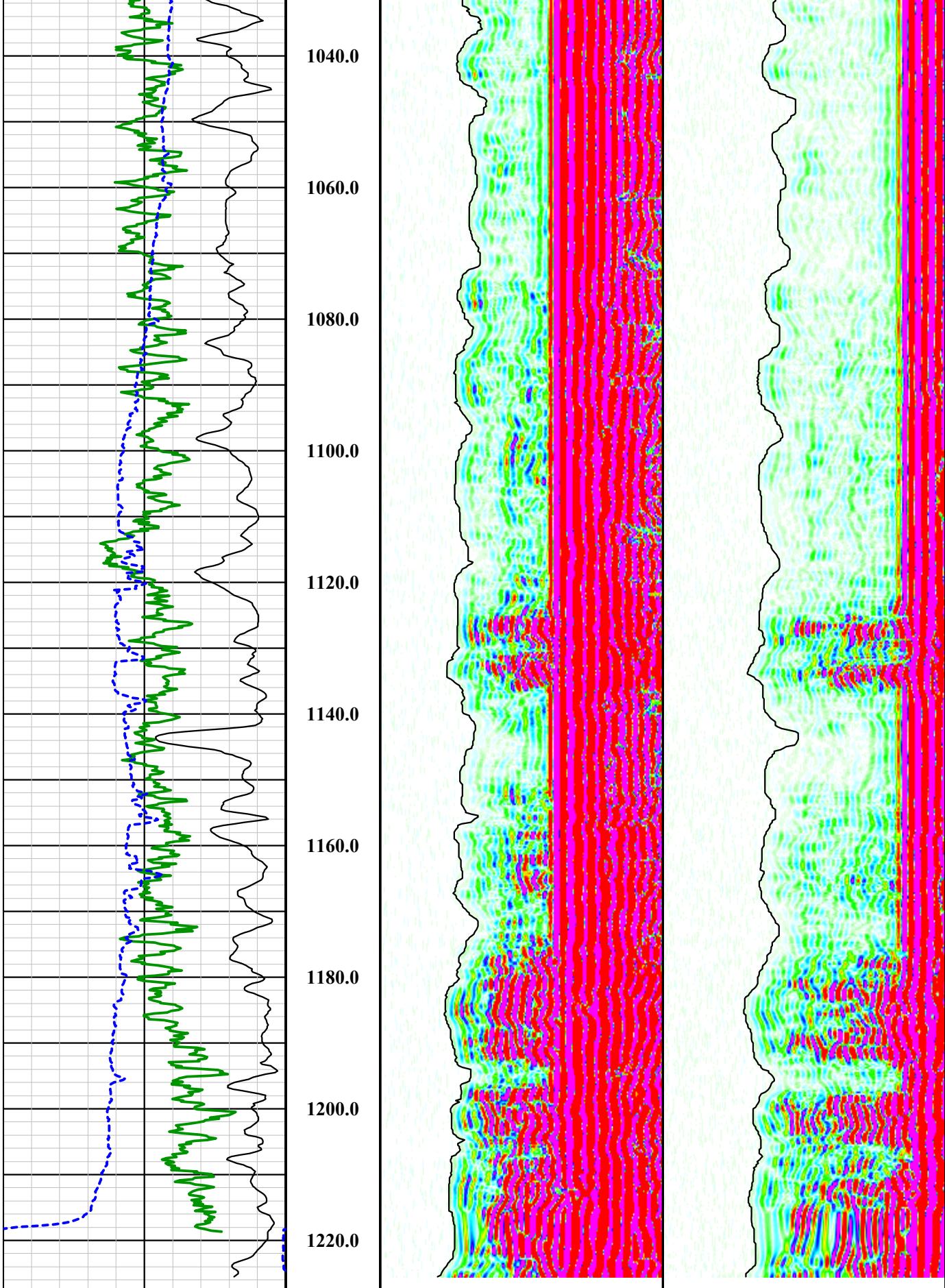












240 uSec/ft 40

Delta T

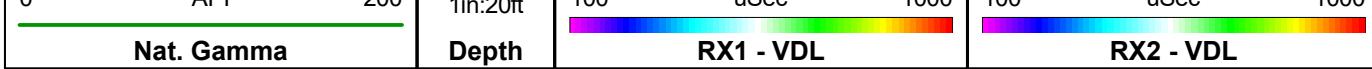
5 Inches 25

3-Arm Caliper

100 uSec 1000 100 uSec 1000

RX1 - Travel Time

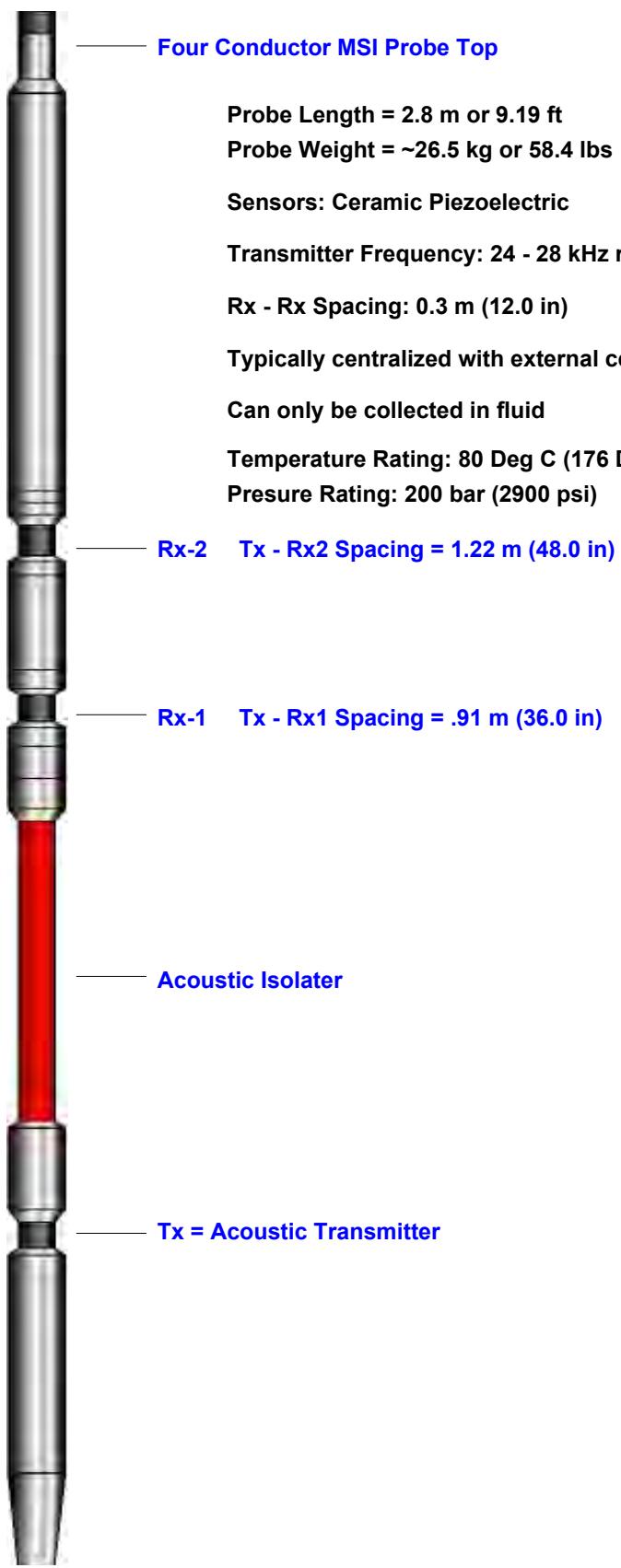
RX2 - Travel Time



MSI 60 mm 2 RX Full Waveform Sonic Tool

Probe Top = Depth Ref.

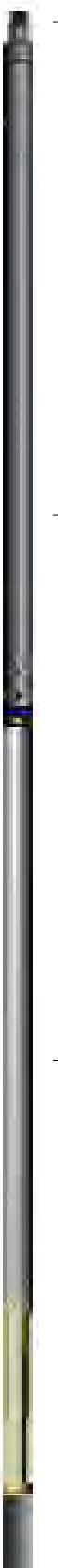
Tool SN: 5001, 5050 & 6003



2.36 in or 60 mm Diameter

MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter



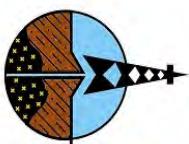
**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company	FLORENCE COPPER
Well	I-02
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final

Sonic Summary



Southwest Exploration Services, LLC

borehole geophysics & video services

COMPANY	FLORENCE COPPER		
WELL ID	I-02		
FIELD	FLORENCE COPPER		
COUNTY	PINAL		
STATE	ARIZONA		
TYPE OF LOGS: 3-ARM CALIPER MORE: W / VOLUME CALC.			
LOCATION			
SEC	TWP	RGE	ELEVATION
PERMANENT DATUM	GROUND LEVEL	ABOVE PERM. DATUM	K.B. D.F. G.L.
DATE	11-17-17	TYPE FLUID IN HOLE	MUD
RUN No	1	MUD WEIGHT	N/A
TYPE LOG	VOLUME CALCULATION	VISCOSITY	N/A
DEPTH-DRILLER	506 FT.	LEVEL	FULL
DEPTH-LOGGER	500 FT.	MAX. REC. TEMP.	22.58 DEG. C
BTM LOGGED INTERVAL	500 FT.	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	SURFACE	SAMPLE INTERVAL	0.2 FT.
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	A. OLSON / M. QUINONES	TOOL STRING/SN	MSI COMBO TOOL SN 4183
WITNESSED BY	COLLIN - H&A	LOG TIME:ON SITE/OFF SITE	12:00 P.M.
RUN	BOREHOLE RECORD		CASING RECORD
NO.	BIT	FROM	TO
1	?	SURFACE	40 FT.
2	20IN.	TOTAL DEPTH	
3			
COMMENTS:			

Tool Summary:					
Date	11-17-17	Date	11-17-17	Date	11-17-17
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	GEOVISTA E-LOG	Tool Model	MSI 60MM SONIC
Tool SN	4183	Tool SN	4790	Tool SN	5001
From	SURFACE	From	SURFACE	From	SURFACE
To	500 FT.	To	500 FT.	To	500 FT.
Recorded By	A. OLSON	Recorded By	A. OLSON	Recorded By	A. OLSON
Truck No	900	Truck No	900	Truck No	900
Operation Check	11-16-17	Operation Check	11-16-17	Operation Check	11-16-17
Calibration Check	11-16-17	Calibration Check	11-16-17	Calibration Check	N/A
Time Logged	12:20 P.M.	Time Logged	12:55 P.M.	Time Logged	1:20 P.M.

Date	11-17-17	Date	11-17-17	Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI DEVIATION	Tool Model	COMPROBE G N	Tool Model	
Tool SN	6002	Tool SN	1107	Tool SN	
From	SURFACE	From	SURFACE	From	
To	500 FT.	To	500 FT.	To	
Recorded By	A. OLSON	Recorded By	A. OLSON	Recorded By	
Truck No	900	Truck No	900	Truck No	
Operation Check	11-13-17	Operation Check	11-13-17	Operation Check	
Calibration Check	N/A	Calibration Check	N/A	Calibration Check	
Time Logged	1:45 P.M.	Time Logged	2:30 P.M.	Time Logged	

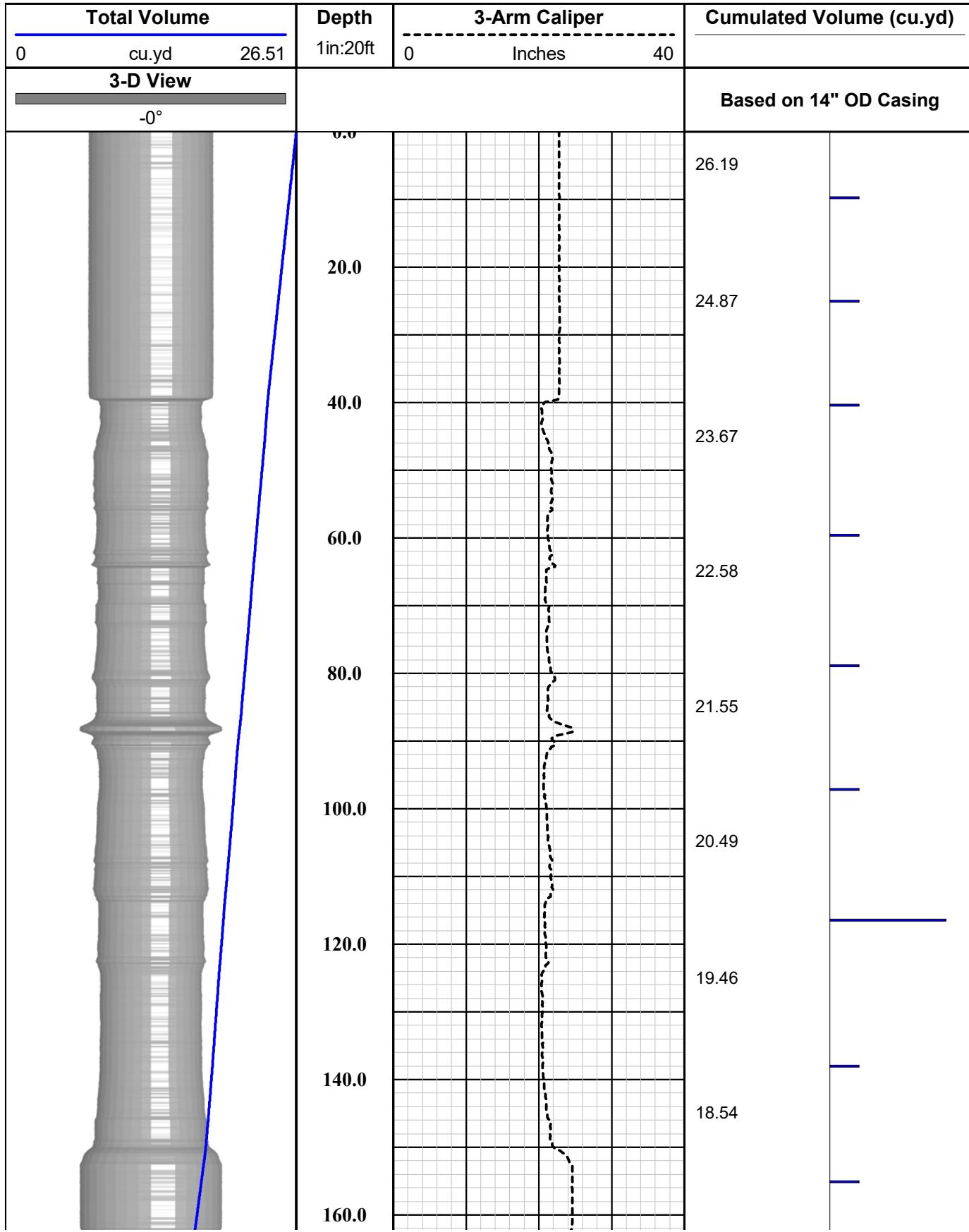
Additional Comments:

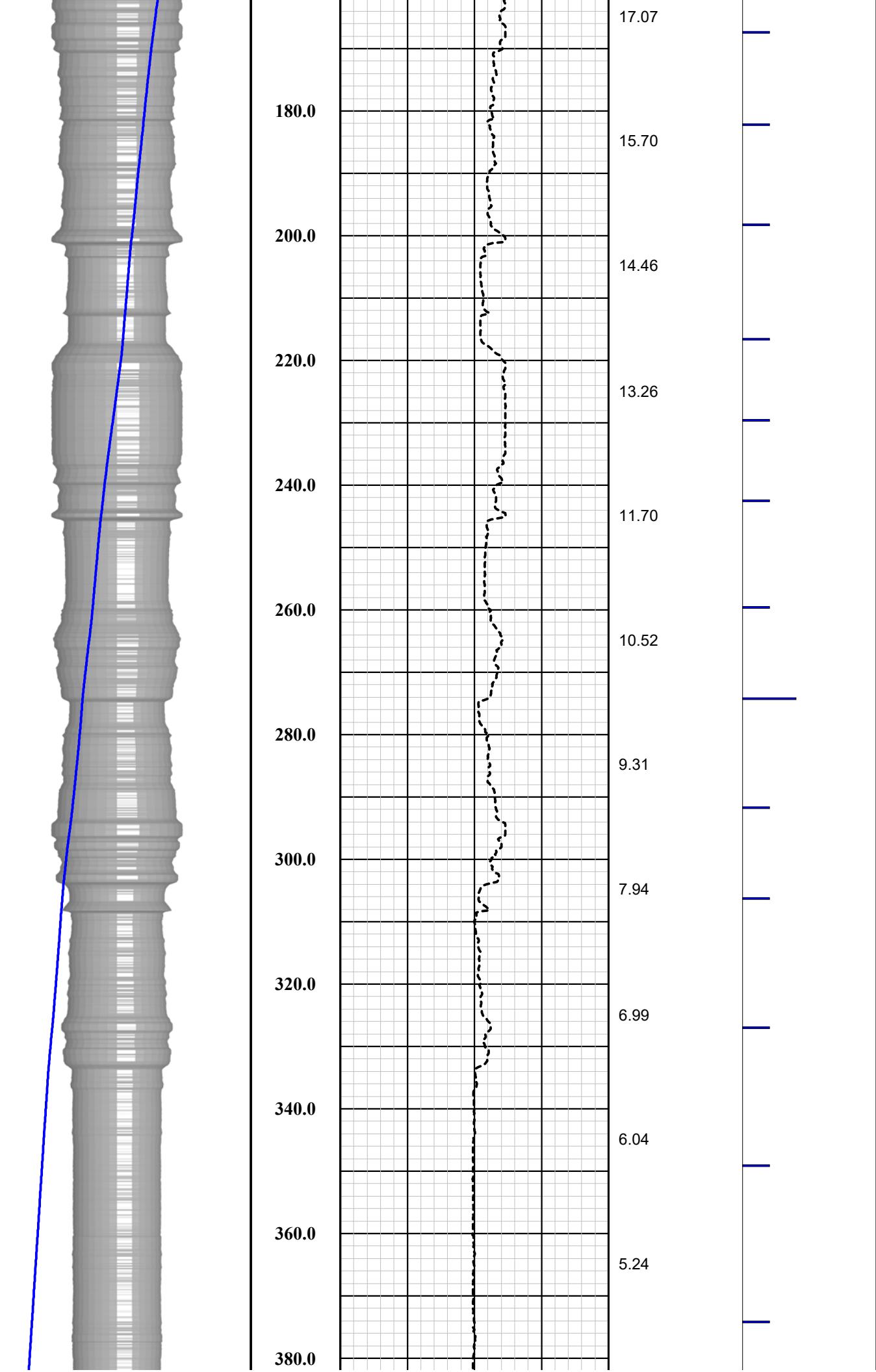
Caliper Arms Used: 15 IN.

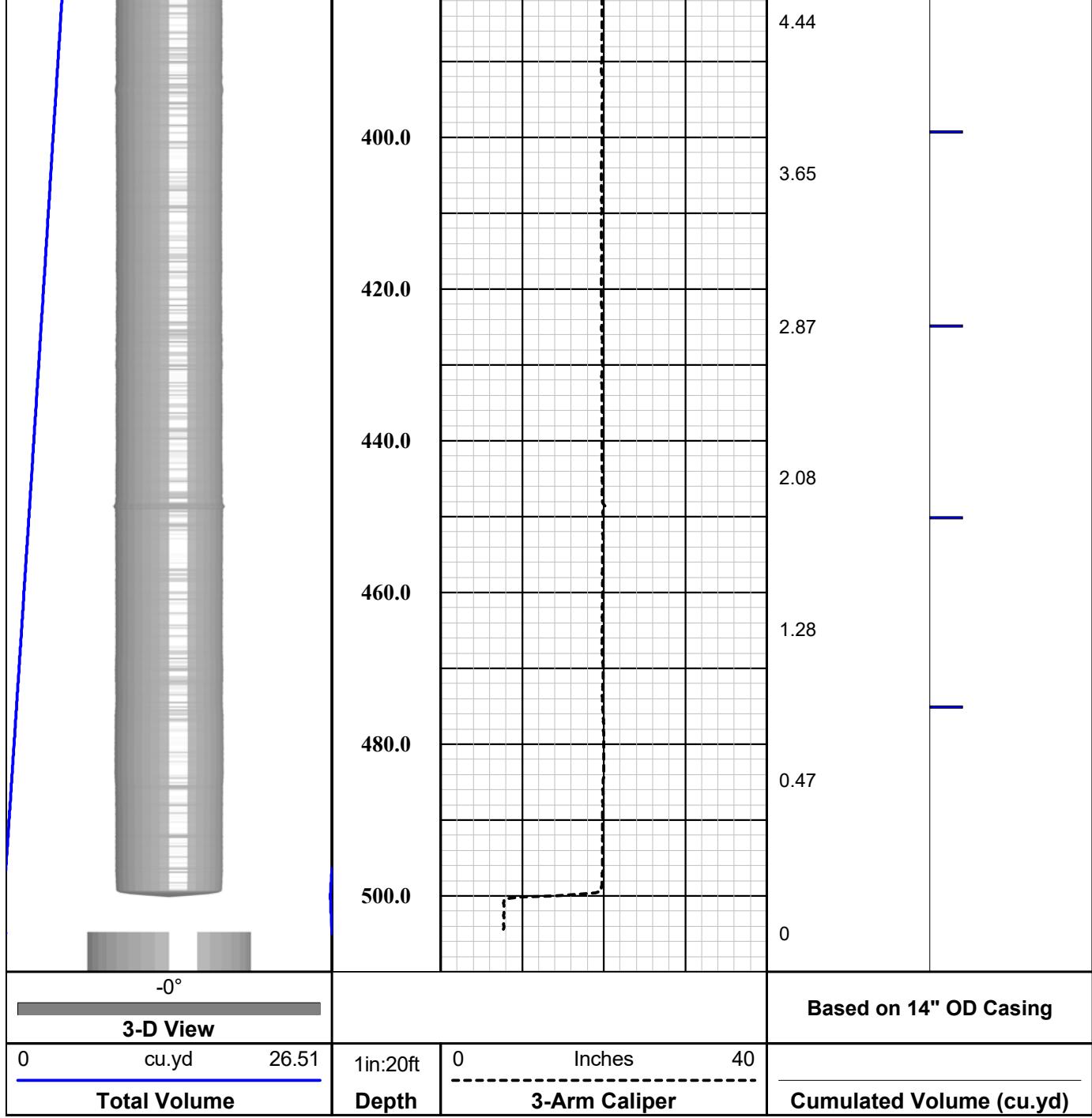
Calibration Points: 8 IN. & 23 IN.

Disclaimer:

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MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

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1.375" or 34.9 mm Diameter



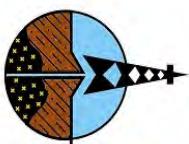
**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company	FLORENCE COPPER
Well	I-02
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final

Caliper w / Volume Calculation Summary



Southwest Exploration Services, LLC

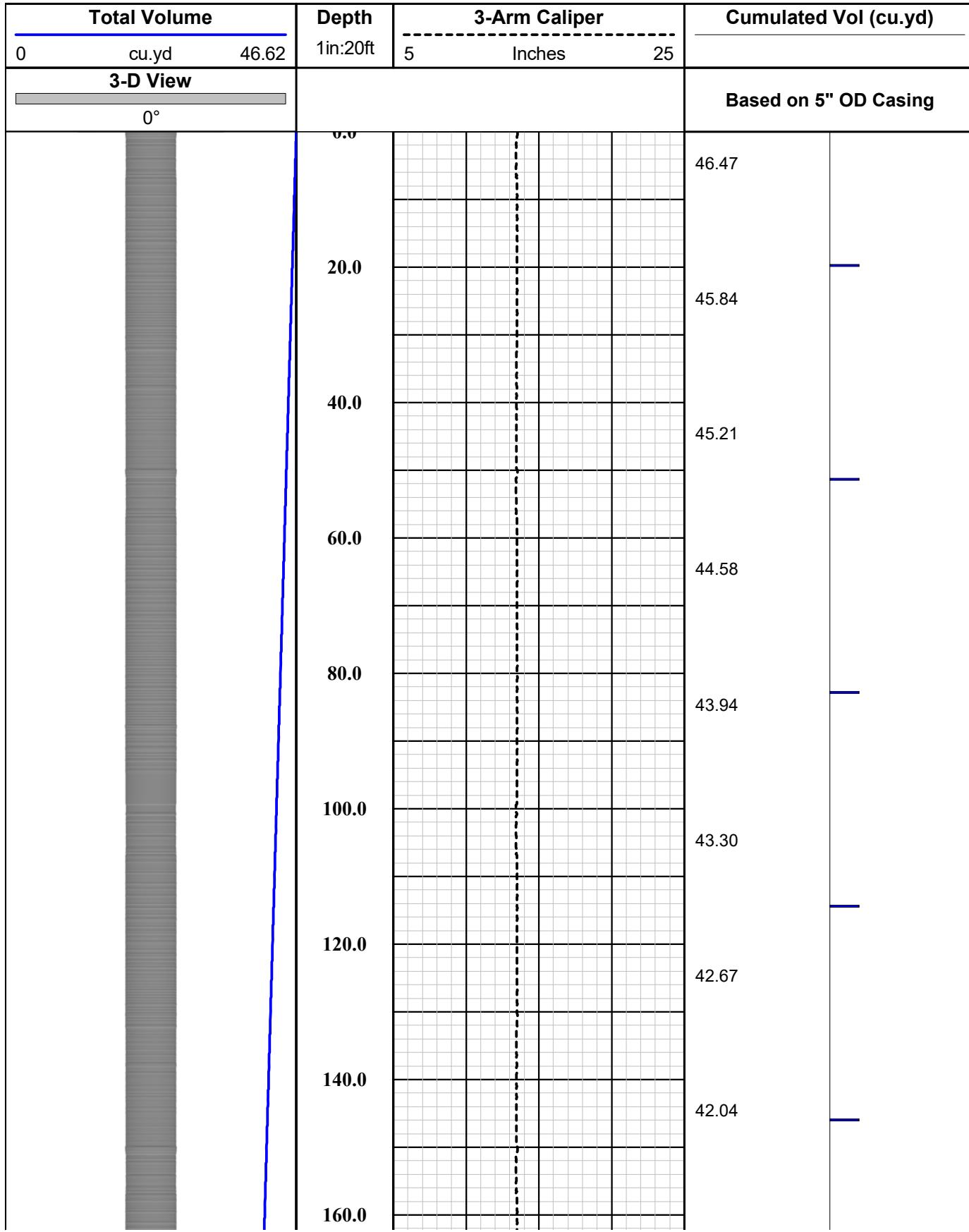
borehole geophysics & video services

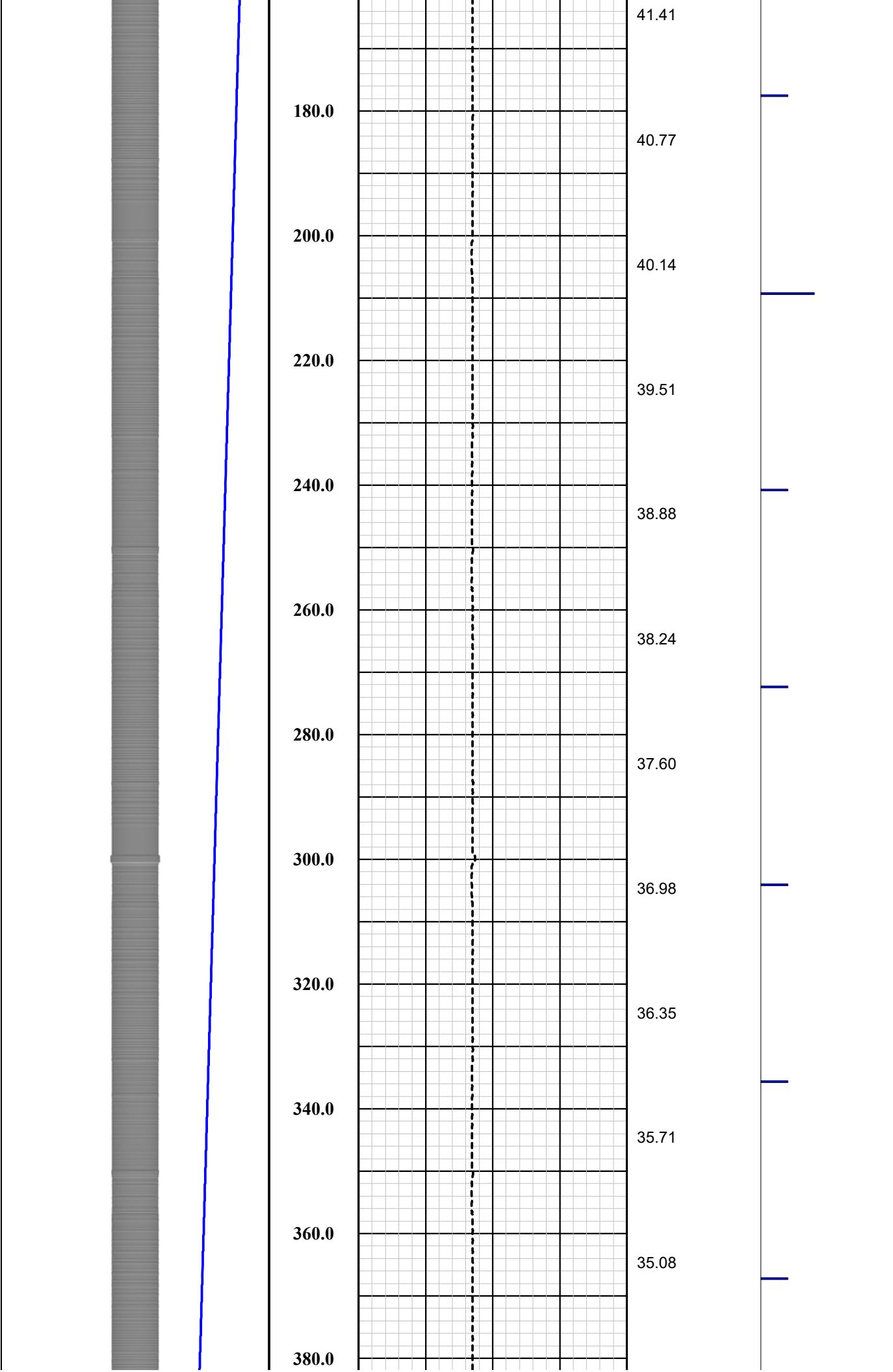
COMPANY	FLORENCE COPPER		
WELL ID	I-02		
FIELD	FLORENCE COPPER		
COUNTY	PINAL		
STATE	ARIZONA		
TYPE OF LOGS: 3-ARM CALIPER MORE: W / VOLUME CALC.			
LOCATION	SEC	TWP	RGE
PERMANENT DATUM	GROUND LEVEL	ABOVE PERM. DATUM	ELEVATION
DATE	2-17-18	TYPE FLUID IN HOLE	K.B.
RUN No	1	MUD WEIGHT	D.F.
TYPE LOG	VOLUME CALCULATION	VISCOSITY	G.L.
DEPTH-DRILLER	1225 FT	LEVEL	
DEPTH-LOGGER	1220 FT	MAX. REC. TEMP.	
BTM LOGGED INTERVAL	1220 FT	IMAGE ORIENTED TO:	N/A
TOP LOGGED INTERVAL	500 FT	SAMPLE INTERVAL	0.2 FT
DRILLER / RIG#	HYDRO RESOURCES	LOGGING TRUCK	TRUCK #900
RECORDED BY / Logging Eng.	M. QUINONES	TOOL STRING/SN	MSI COMBO TOOL SN 4009
WITNESSED BY	GENO - H&A	LOG TIME:ON SITE/OFF SITE	3:30 AM
Tool Summary:			
Date	2-17-18	Date	2-17-18
Run No.	1	Run No.	2
Tool Model	MSI COMBO TOOL	Tool Model	GEOVISTA E-LOG
Tool SN	4009	Tool SN	4035
From	500 FT	From	500 FT
To	1220 FT	To	1220 FT
Recorded By	M. QUINONES	Recorded By	M. QUINONES
Truck No	900	Truck No	900
Operation Check	2-16-18	Operation Check	2-16-18
Calibration Check	2-16-18	Calibration Check	2-16-18
Time Logged	3:50 AM	Time Logged	5:00 AM
Date	2-17-18	Date	2-17-18
Run No.	4	Run No.	5
Tool Model	MSI DEVIATION	Tool Model	COMPROBE G-N
Tool SN	6002	Tool SN	1107
From	500 FT	From	500 FT
To	1220 FT	To	1220 FT
Recorded By	M. QUINONES	Recorded By	M. QUINONES
Truck No	900	Truck No	900
Operation Check	2-16-18	Operation Check	2-16-18
Calibration Check	N/A	Calibration Check	N/A
Time Logged	6:50 AM	Time Logged	7:40 AM
Additional Comments:			
Caliper Arms Used:	15 IN.		
Calibration Points:	8 IN. & 23 IN.		
Comments:			

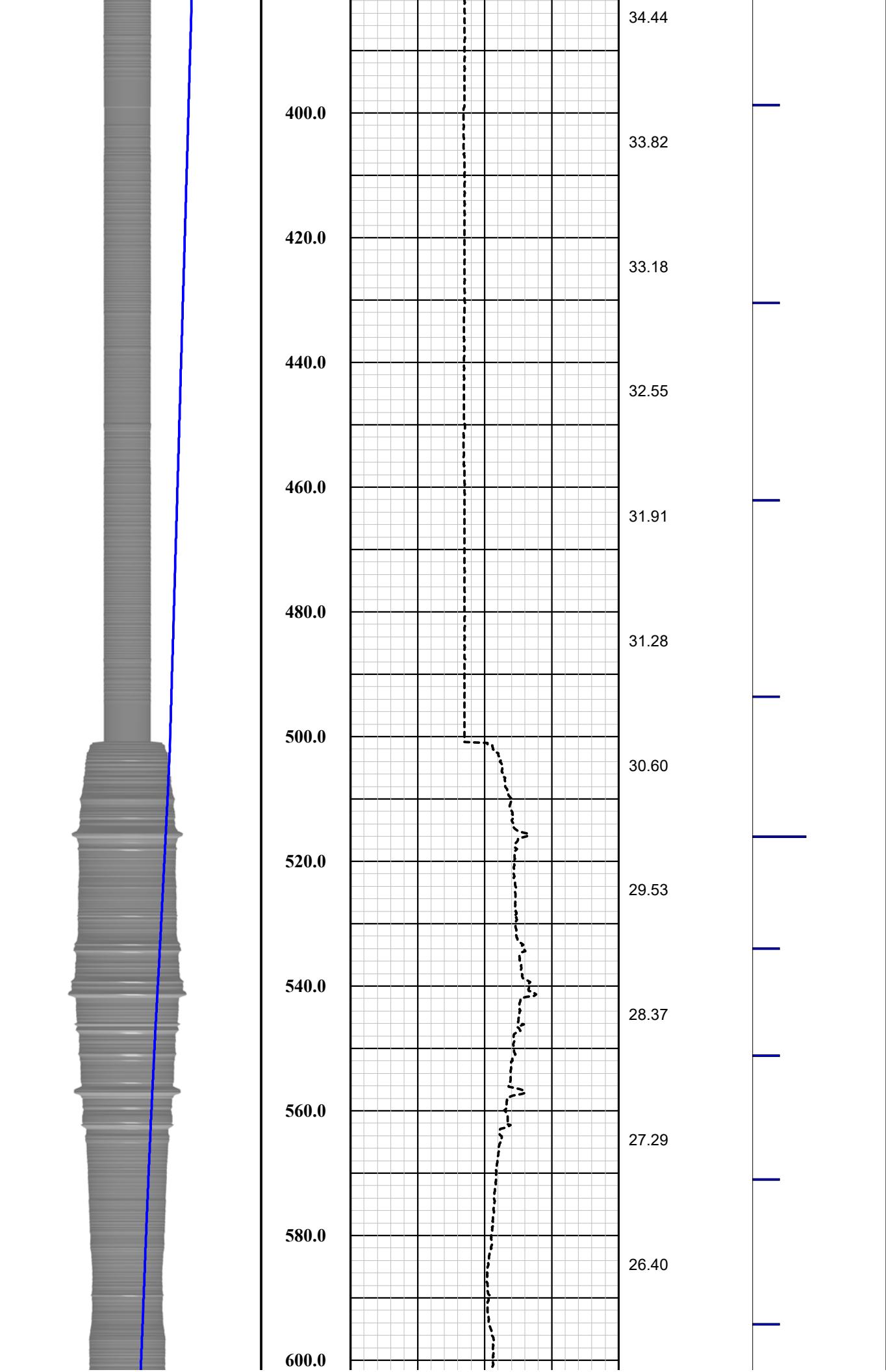
Date	2-17-18	Date	2-17-18	Date	2-17-18
Run No.	4	Run No.	5	Run No.	6
Tool Model	MSI DEVIATION	Tool Model	COMPROBE G-N	Tool Model	
Tool SN	6002	Tool SN	1107	Tool SN	
From	500 FT	From	500 FT	From	
To	1220 FT	To	1220 FT	To	
Recorded By	M. QUINONES	Recorded By	M. QUINONES	Recorded By	
Truck No	900	Truck No	900	Truck No	
Operation Check	2-16-18	Operation Check	2-16-18	Operation Check	
Calibration Check	N/A	Calibration Check	N/A	Calibration Check	
Time Logged	6:50 AM	Time Logged	7:40 AM	Time Logged	

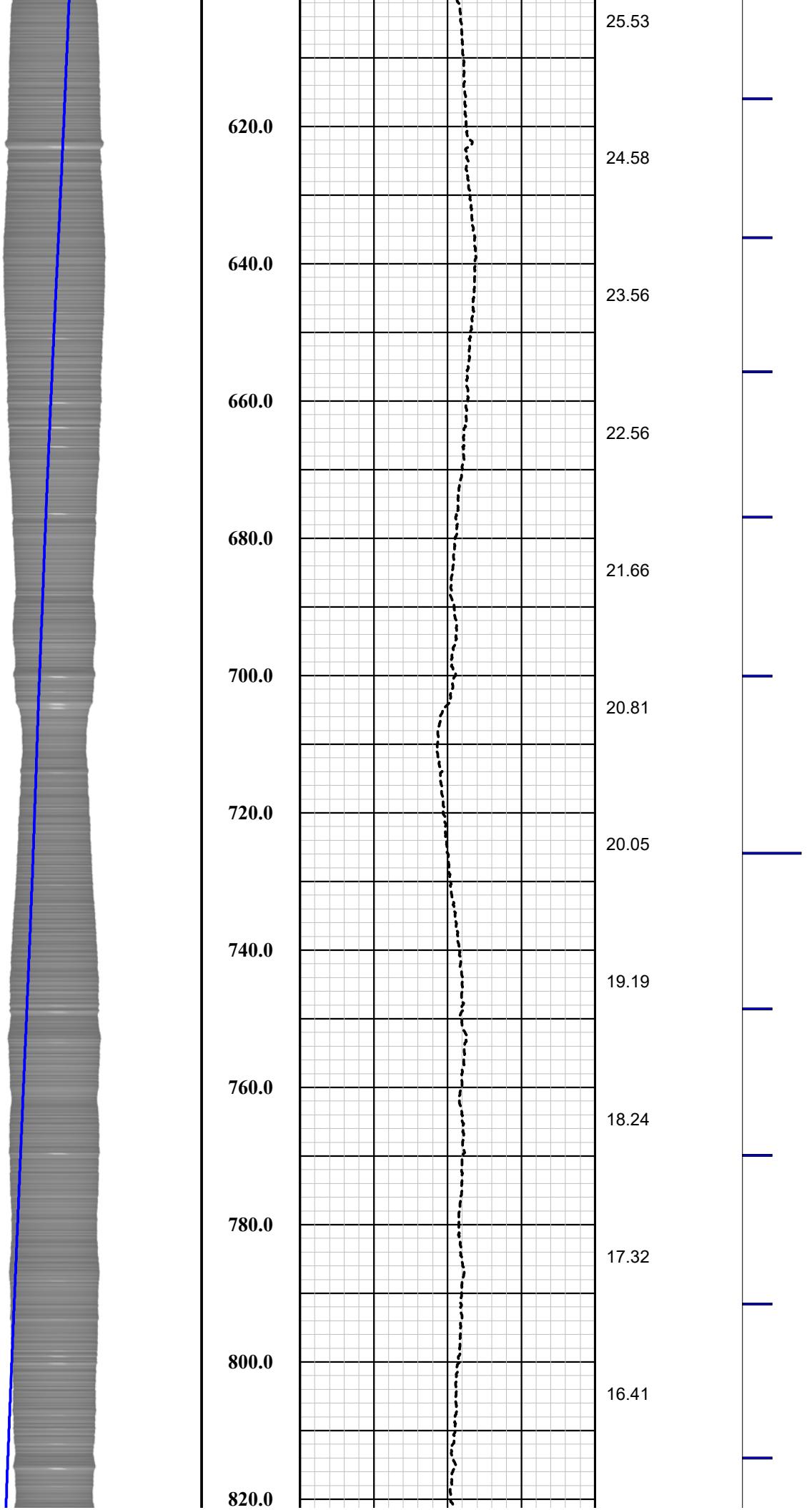
Disclaimer:

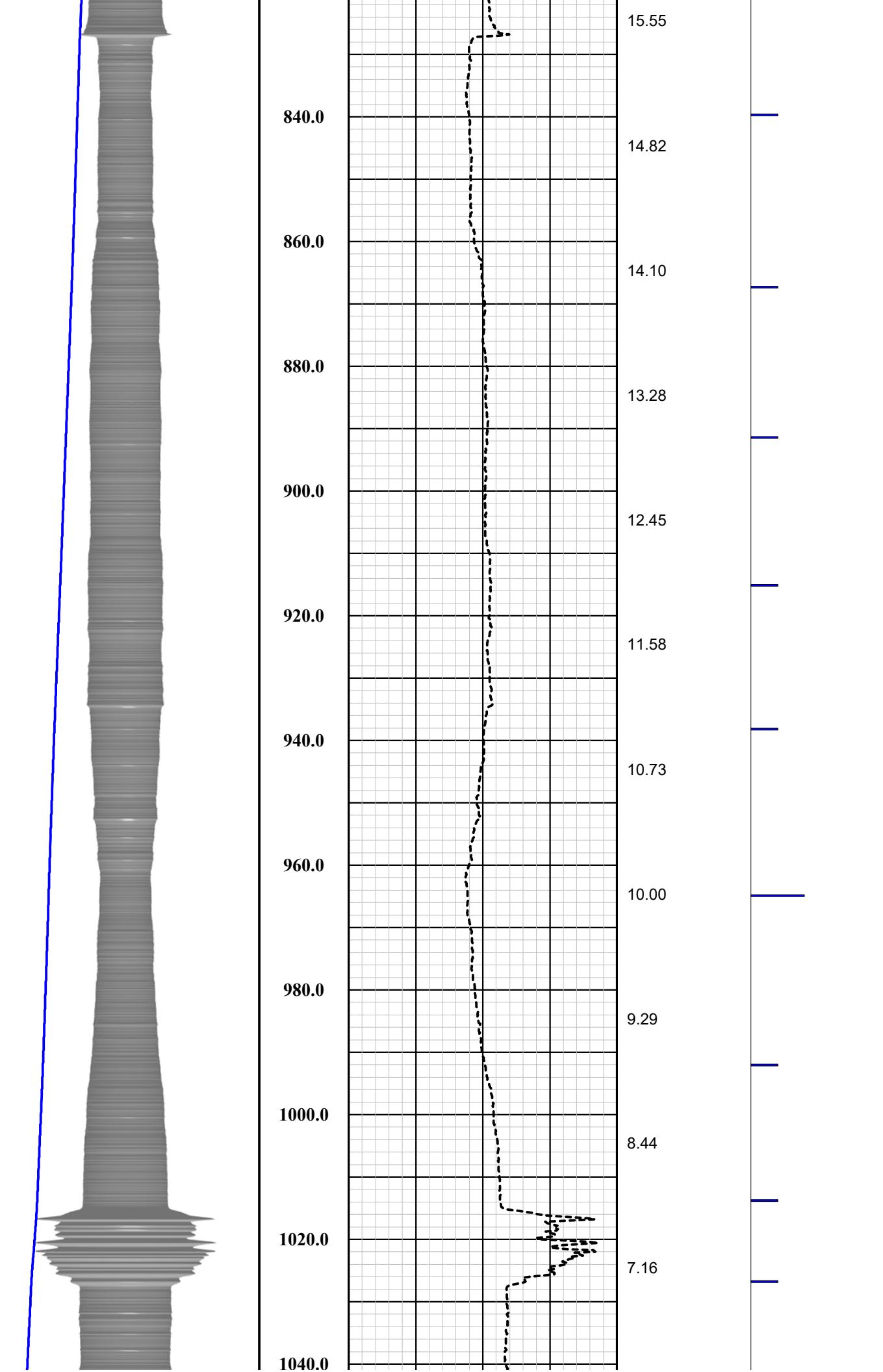
All interpretations of log data are opinions based on inferences from electrical or other measurements. We do not guarantee the accuracy or correctness of any interpretations or recommendations and shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by anyone resulting from any interpretation made by any of our employees or agents. These interpretations are also subject to our general terms and conditions set out in our current Service Invoice.

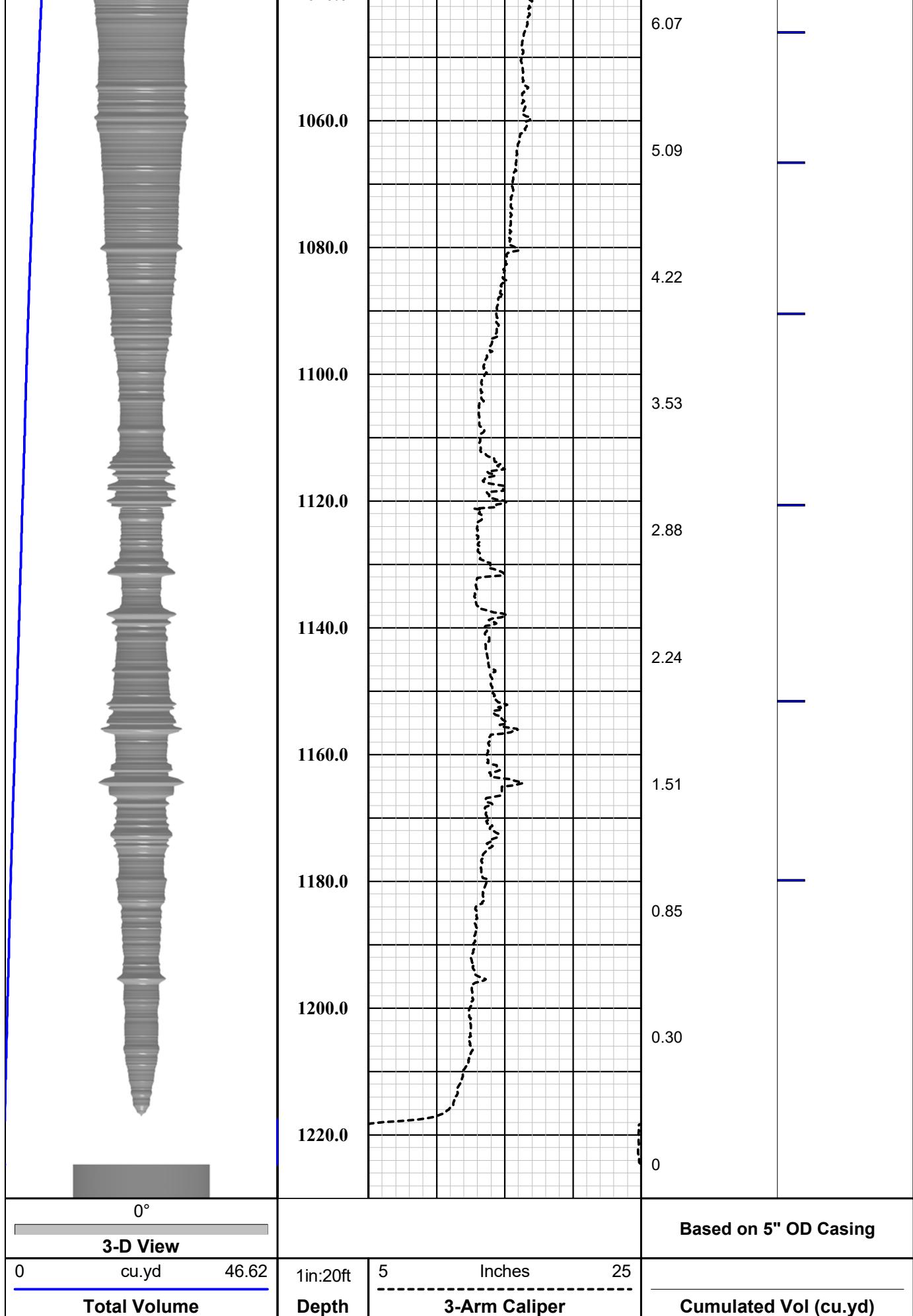






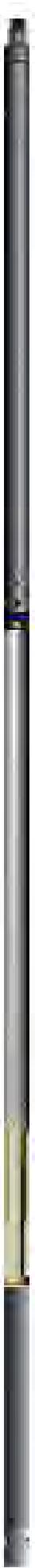






MSI Gamma Caliper Temperature/Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)



**Southwest Exploration
Services, LLC**

borehole geophysics & video services

Company	FLORENCE COPPER
Well	I-02
Field	FLORENCE COPPER
County	PINAL
State	ARIZONA

Final

Caliper w/ Volume Calculation Summary

Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR
FLORENCE COPPER
I-02

Friday - November 17, 2017

This Wellbore Interpretation Package represents our best efforts to provide a correct interpretation. Nevertheless, since all interpretations are opinions based on inferences from electrical or other types of measurements, we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by Customer resulting from any interpretation made by this document. We do not warrant or guarantee the accuracy of the data, specifically including (but without limitations) the accuracy of data transmitted by electronic process, and we will not be responsible for accidental or intentional interception of such data by third parties. Our employees are not empowered to change or otherwise modify the attached interpretation. Furthermore, along with Eagle Pro Software we do not warrant or guarantee the accuracy of the programming techniques employed to produce this document. By accepting this Interpretation Package, the Customer agrees to the foregoing, and to our General Terms and Conditions.



Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

Company:	FLORENCE COPPER		Well Owner:				
County:	PINAL	State:	Arizona	Country:	United States		
Well Number:	I-02	Survey Date:	Friday - November 17, 2017	Magnetic Declination:	Declination Correction Not Used		
Field:	FLORENCE COPPER		Drift Calculation Methodology:		Balanced Tangential Method		
Location:							
Remarks:							
Witness:	COLLIN - H&A	Vehicle No.:	900	Invoice No.:			
Tool:	Gyro - 201		Lat.:	Long.:	Sec.:	Twp.:	Rge.:

MEASURED DATA			DATA COMPUTATIONS						
DEPTHs, feet	INCLINATIONS, degrees	AZIMUTHs, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEg SEV., degrees per 20 Feet	DOGLEg SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
0	0.74	164.28	0.00						
20	0.27	203.54	19.99	-0.168	0.016	1.00	0.73	0.17' (2.04")	174.50
40	0.51	161.14	39.98	-0.295	0.026	0.41	0.78	0.30' (3.60")	175.00
60	0.15	203.20	59.97	-0.403	0.044	0.96	0.78	0.41' (4.92")	173.70
80	0.05	002.80	79.96	-0.418	0.034	0.84	2.13	0.42' (5.04")	175.30
100	0.03	262.80	99.96	-0.410	0.029	0.42	1.66	0.41' (4.92")	175.90
120	0.11	321.06	119.95	-0.396	0.012	0.13	1.05	0.40' (4.80")	178.30
140	0.09	037.55	139.94	-0.369	0.010	0.43	1.34	0.37' (4.44")	178.50
160	0.03	080.15	159.93	-0.356	0.025	0.83	0.79	0.36' (4.32")	176.00
180	0.03	019.94	179.92	-0.350	0.032	0.95	1.09	0.35' (4.20")	174.80
200	0.04	243.54	199.91	-0.348	0.028	0.37	2.01	0.35' (4.20")	175.50
220	0.06	007.92	219.90	-0.341	0.023	1.00	1.91	0.34' (4.08")	176.10
240	0.05	351.50	239.89	-0.322	0.023	1.00	0.31	0.32' (3.84")	175.90
260	0.32	009.61	259.88	-0.258	0.031	0.34	0.34	0.26' (3.12")	173.10
280	0.16	039.33	279.87	-0.181	0.058	0.93	0.55	0.19' (2.28")	162.30
300	0.32	052.79	299.86	-0.126	0.120	0.78	0.25	0.17' (2.04")	136.30
320	0.48	067.26	319.85	-0.060	0.242	0.53	0.27	0.25' (3.00")	103.90
340	0.16	096.52	339.84	-0.031	0.347	0.00	0.55	0.35' (4.20")	095.10

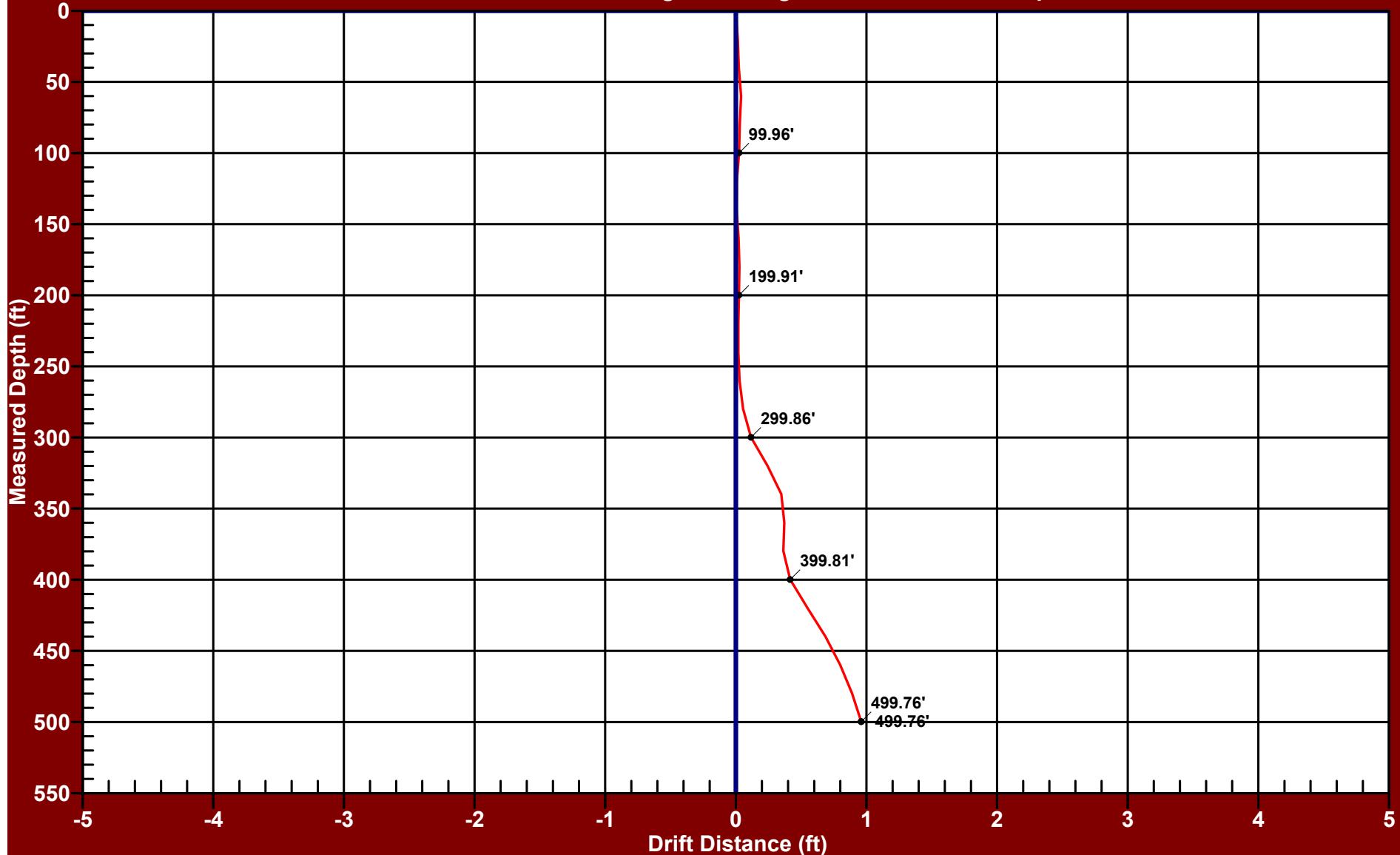
Page No. 1 True Vertical Depth: **499.76'** Final Drift Distance: **.96' (11.52")** Final Drift Bearing: **89.40°**

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

PLANE OF DRIFT VIEW - I-02

FLORENCE COPPER

Drift Distance = 0.96 Feet Drift Bearing = 89.4 Degrees True Vertical Depth = 499.76 Feet



Date of Survey: Friday - November 17, 2017

Balanced Tangential Calculation Method

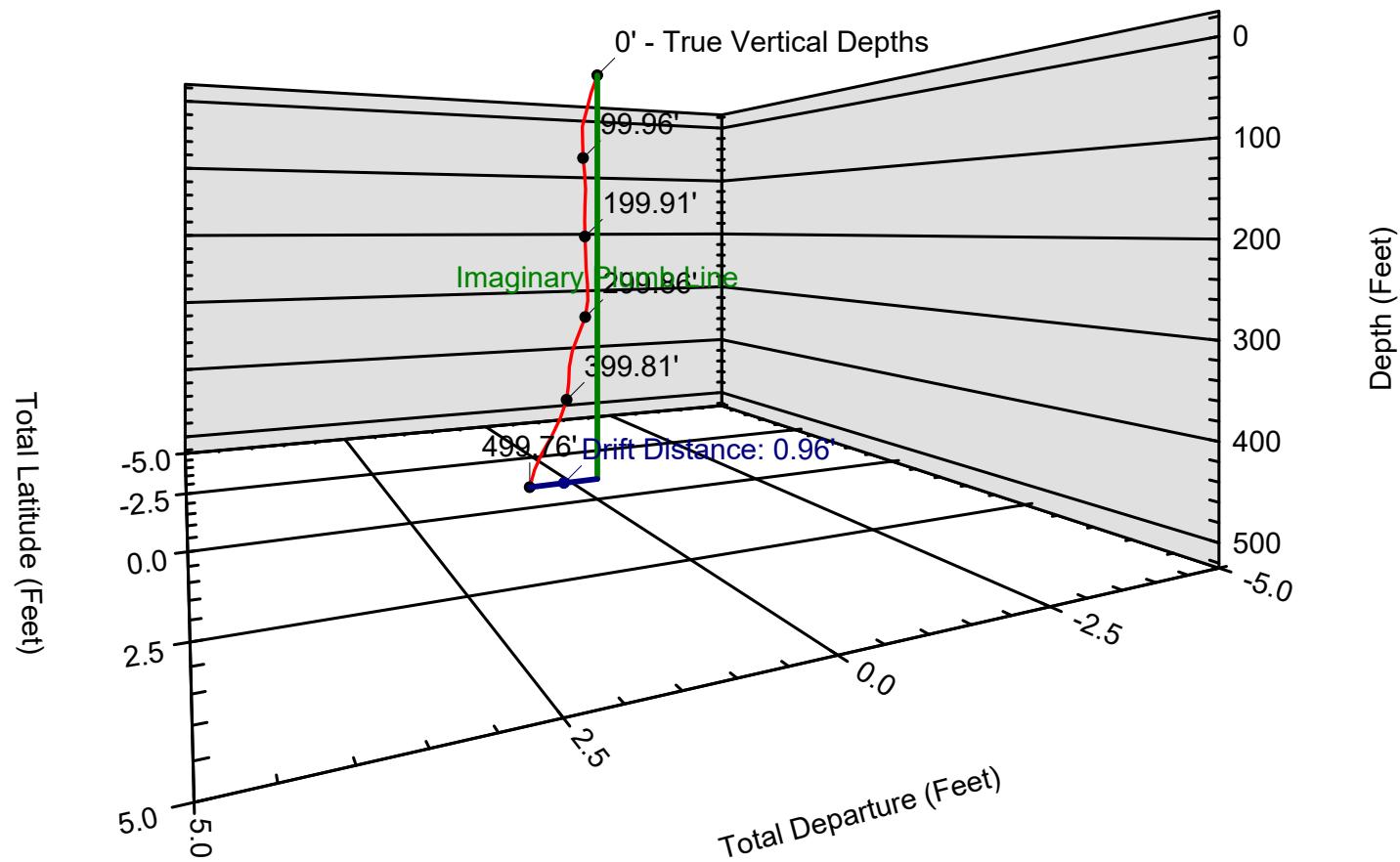
Southwest Exploration Services, LLC (480) 926-4558

3D PROJECTION VIEW - I-02

FLORENCE COPPER

Drift Distance = 0.96 Feet Drift Bearing = 89.4 Degrees True Vertical Depth = 499.76 Feet

336.0



Date of Survey: Friday - November 17, 2017

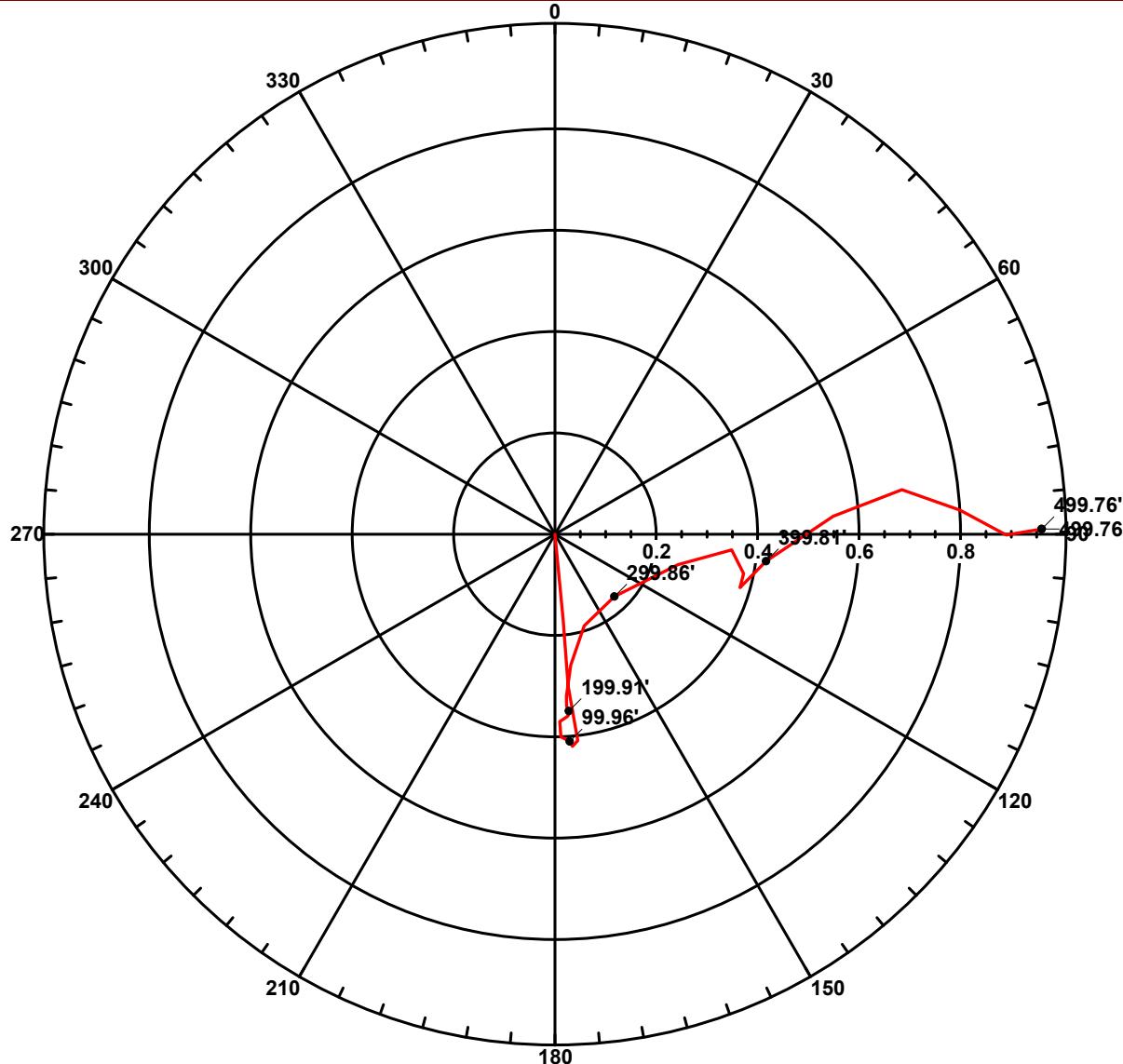
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

POLAR VIEW - I-02

FLORENCE COPPER

Drift Distance = 0.96 Feet Drift Bearing = 89.4 Degrees True Vertical Depth = 499.76 Feet



Date of Survey: Friday - November 17, 2017

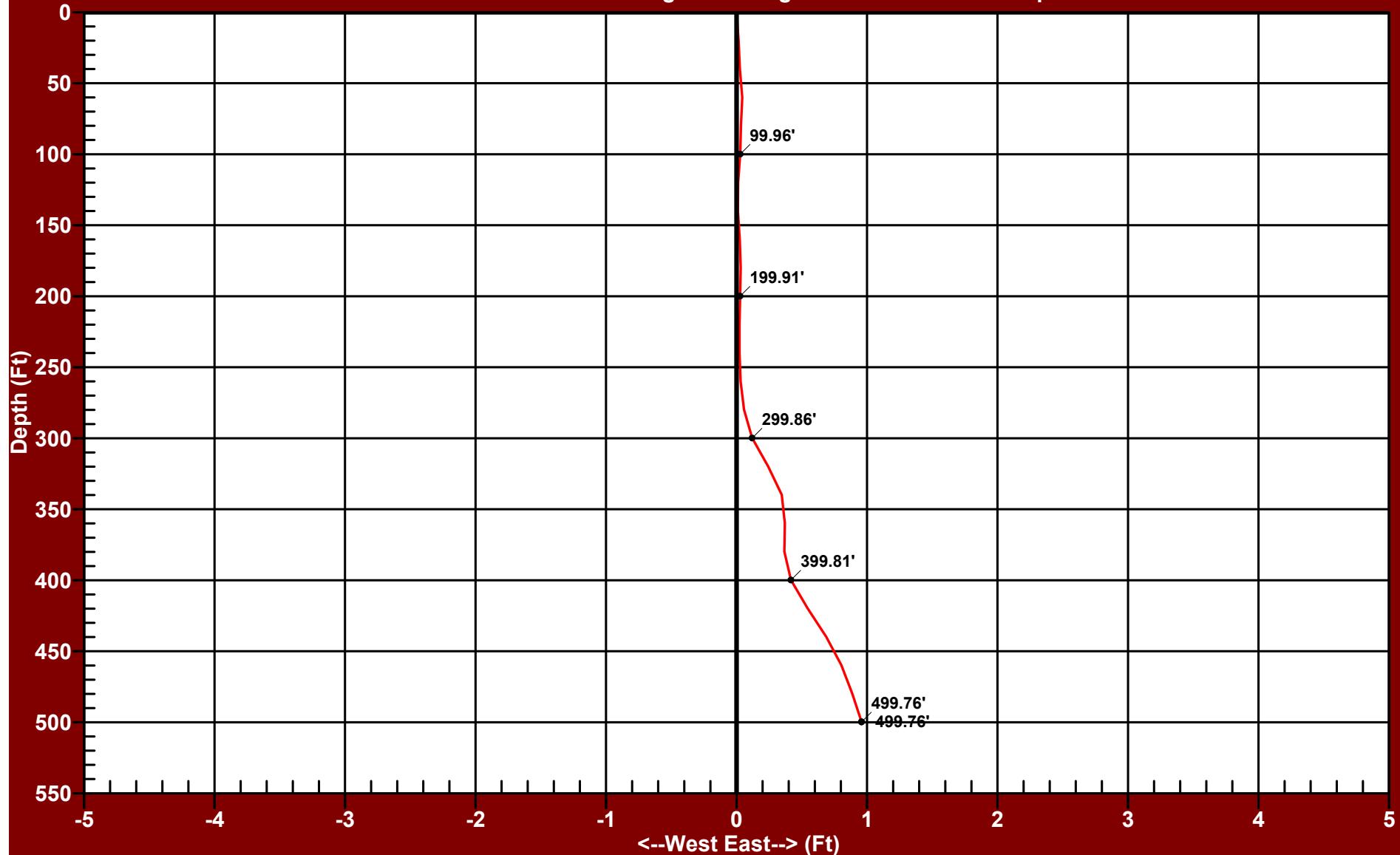
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

EASTING RECTANGULAR VIEW - I-02

FLORENCE COPPER

Drift Distance = 0.96 Feet Drift Bearing = 89.4 Degrees True Vertical Depth = 499.76 Feet



Date of Survey: Friday - November 17, 2017

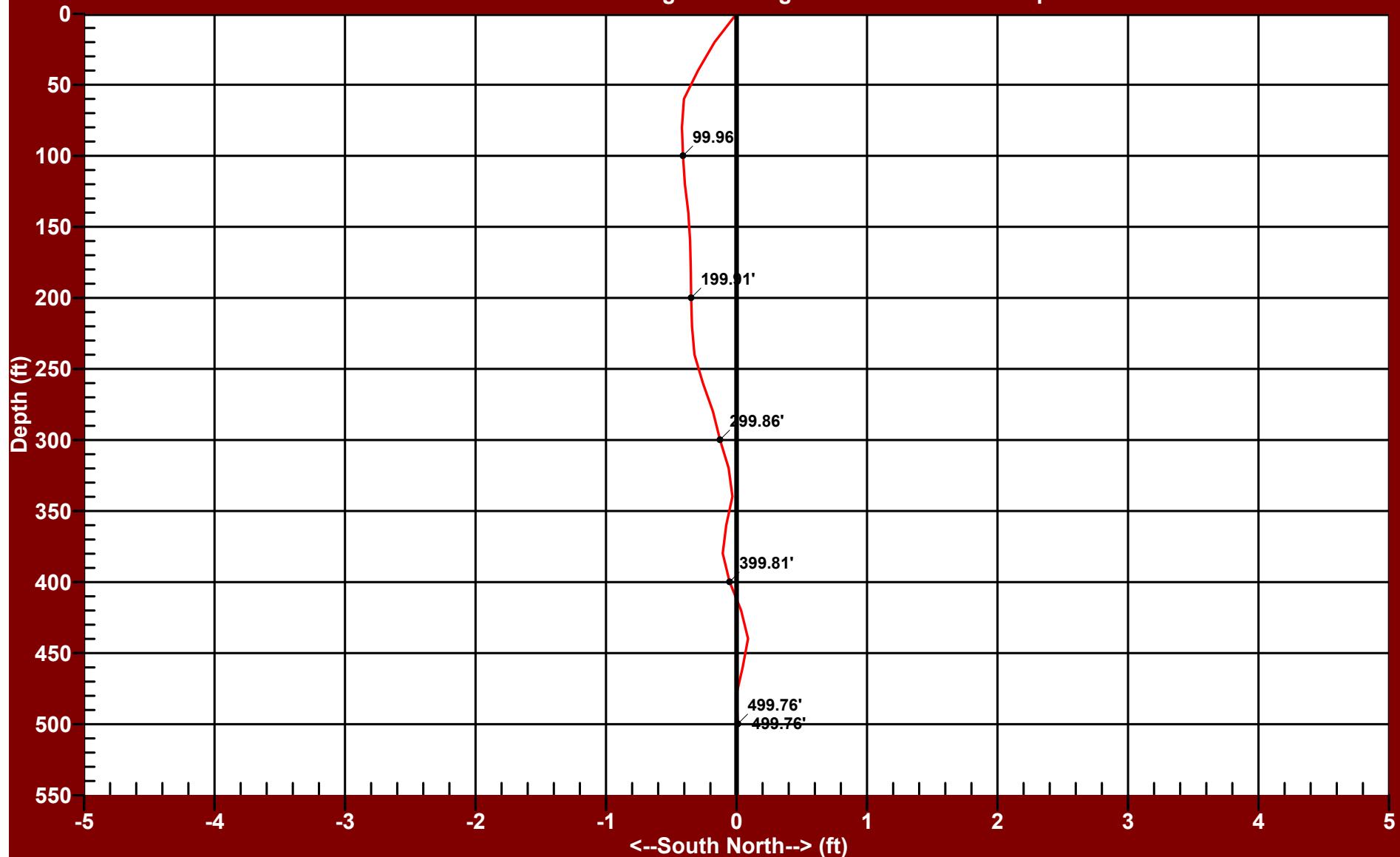
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

NORTHING RECTANGULAR VIEW - I-02

FLORENCE COPPER

Drift Distance = 0.96 Feet Drift Bearing = 89.4 Degrees True Vertical Depth = 499.76 Feet



Date of Survey: Friday - November 17, 2017

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR
FLORENCE COPPER

I-02

Saturday - February 17, 2018

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Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

Company:	FLORENCE COPPER		Well Owner:			
County:	PINAL	State:	Arizona	Country:	United States	
Well Number:	I-02	Survey Date:	Saturday - February 17, 2018	Magnetic Declination:	Declination Correction Not Used	
Field:	FLORENCE COPPER		Drift Calculation Methodology:		Balanced Tangential Method	
Location:						
Remarks:						
Witness:	Vehicle No.:	900	Invoice No.:			
Tool:	Compass - 6002		Lat.:	Long.:	Sec.:	Twp.:
						Rge.:

MEASURED DATA			DATA COMPUTATIONS						
DEPTHs, feet	INCLINATIONS, degrees	AZIMUTHs, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEg SEV., degrees per 20 Feet	DOGLEg SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
520	0.12	354.45	520.00						
540	0.16	044.20	539.99	0.041	0.017	0.16	1.72	0.04' (.48")	023.10
560	0.14	026.56	559.98	0.083	0.047	0.39	0.63	0.10' (1.20")	029.80
580	0.17	022.03	579.97	0.132	0.069	0.17	0.16	0.15' (1.80")	027.60
600	0.21	023.41	599.96	0.193	0.095	0.95	0.05	0.22' (2.64")	026.10
620	0.23	053.87	619.95	0.250	0.142	1.00	1.07	0.29' (3.48")	029.60
640	0.25	078.85	639.94	0.282	0.217	0.61	0.88	0.36' (4.32")	037.60
660	0.17	112.42	659.93	0.279	0.287	0.98	1.18	0.40' (4.80")	045.80
680	0.15	104.10	679.92	0.261	0.340	0.98	0.30	0.43' (5.16")	052.40
700	0.23	080.04	699.91	0.262	0.405	0.58	0.85	0.48' (5.76")	057.10
720	0.18	085.22	719.90	0.272	0.476	0.99	0.18	0.55' (6.60")	060.30
740	0.18	093.46	739.89	0.273	0.539	0.91	0.29	0.60' (7.20")	063.10
760	0.08	068.02	759.88	0.276	0.583	0.29	0.90	0.65' (7.80")	064.70
780	0.10	061.91	779.87	0.289	0.611	0.26	0.22	0.68' (8.16")	064.70
800	0.16	052.27	799.86	0.314	0.648	0.33	0.34	0.72' (8.64")	064.10
820	0.31	082.70	819.85	0.338	0.724	0.88	1.07	0.80' (9.60")	065.00
840	0.27	106.32	839.84	0.332	0.823	0.97	0.84	0.89' (10.68")	068.10
860	0.22	066.18	859.83	0.334	0.903	0.44	1.40	0.96' (11.52")	069.70

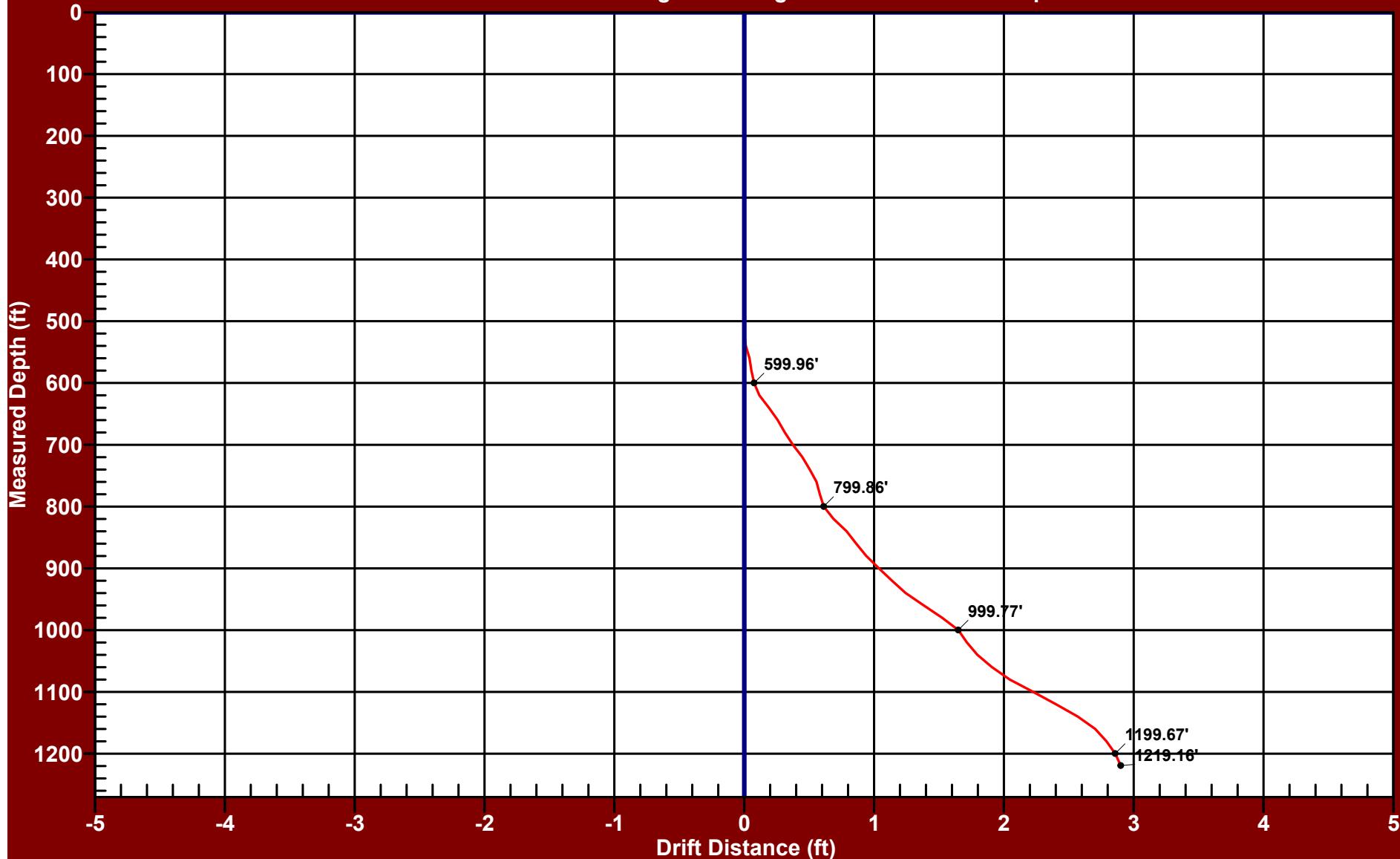
Page No. 1 True Vertical Depth: 1219.16' **Final Drift Distance: 2.90' (34.80")** **Final Drift Bearing: 95.80°**

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

PLANE OF DRIFT VIEW - I-02

FLORENCE COPPER

Drift Distance = 2.90 Feet Drift Bearing = 95.8 Degrees True Vertical Depth = 1219.16 Feet



Date of Survey: Saturday - February 17, 2018

Balanced Tangential Calculation Method

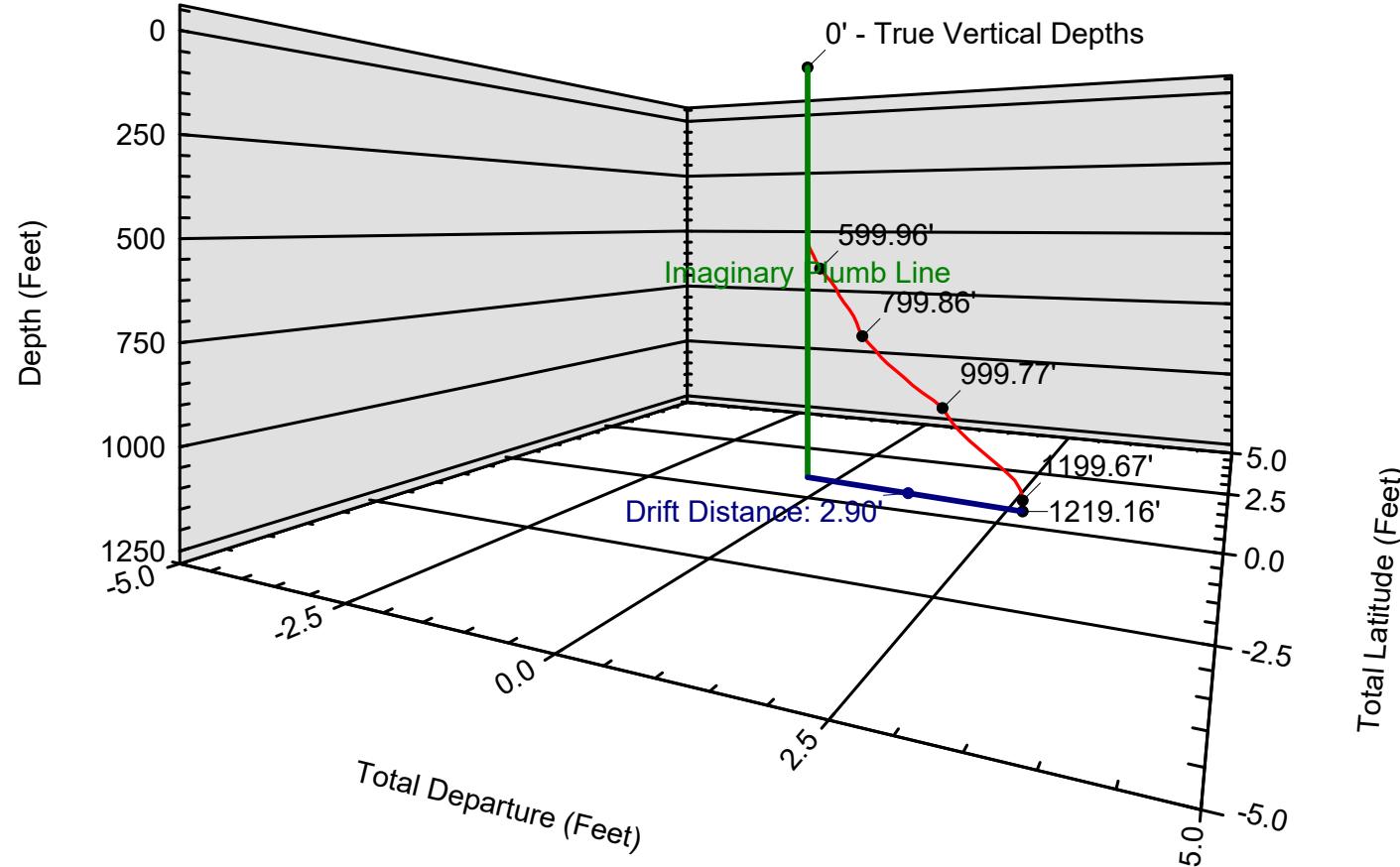
Southwest Exploration Services, LLC (480) 926-4558

3D PROJECTION VIEW - I-02

FLORENCE COPPER

Drift Distance = 2.90 Feet Drift Bearing = 95.8 Degrees True Vertical Depth = 1219.16 Feet

205.0



Date of Survey: Saturday - February 17, 2018

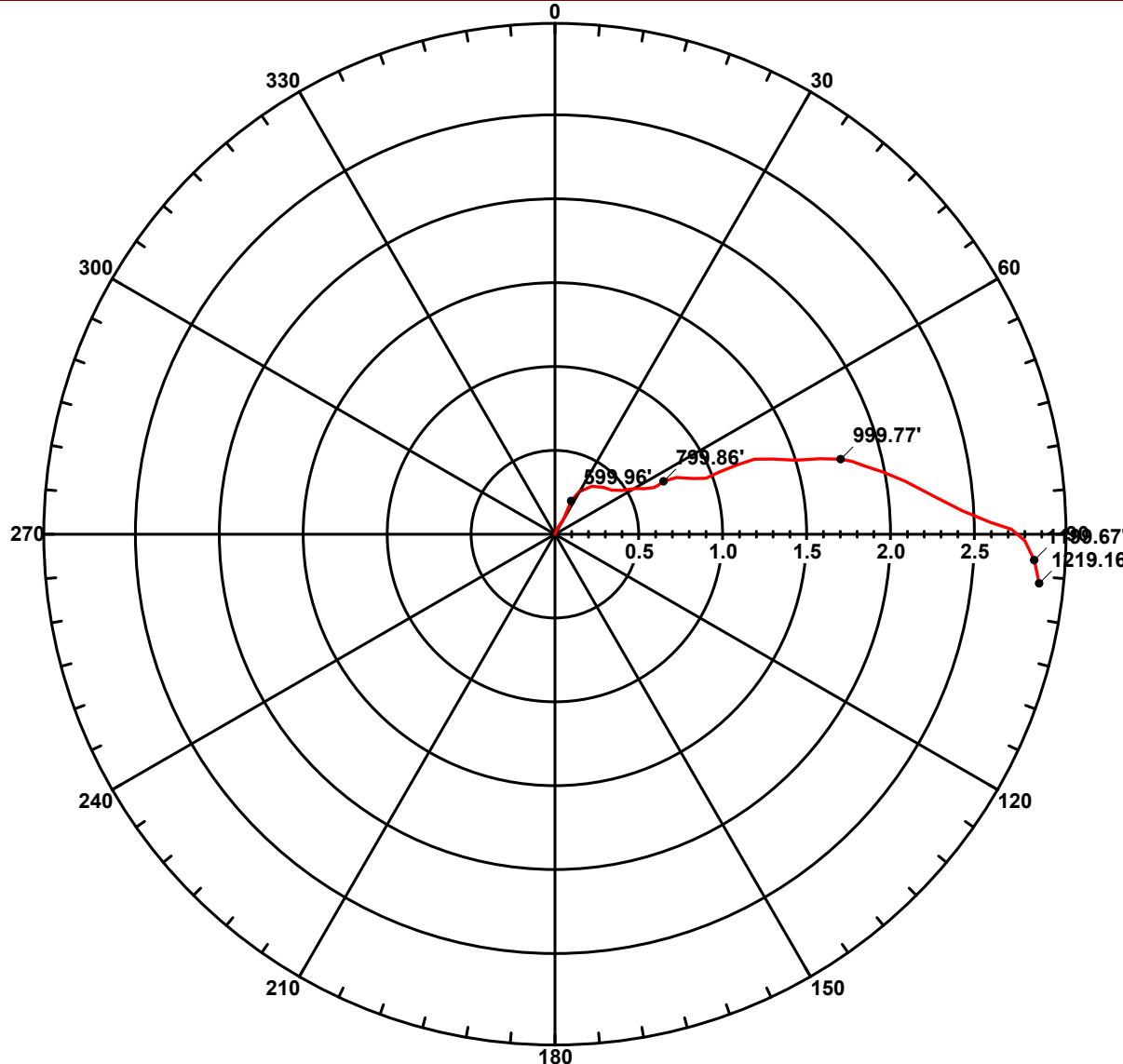
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

POLAR VIEW - I-02

FLORENCE COPPER

Drift Distance = 2.90 Feet Drift Bearing = 95.8 Degrees True Vertical Depth = 1219.16 Feet



Date of Survey: Saturday - February 17, 2018

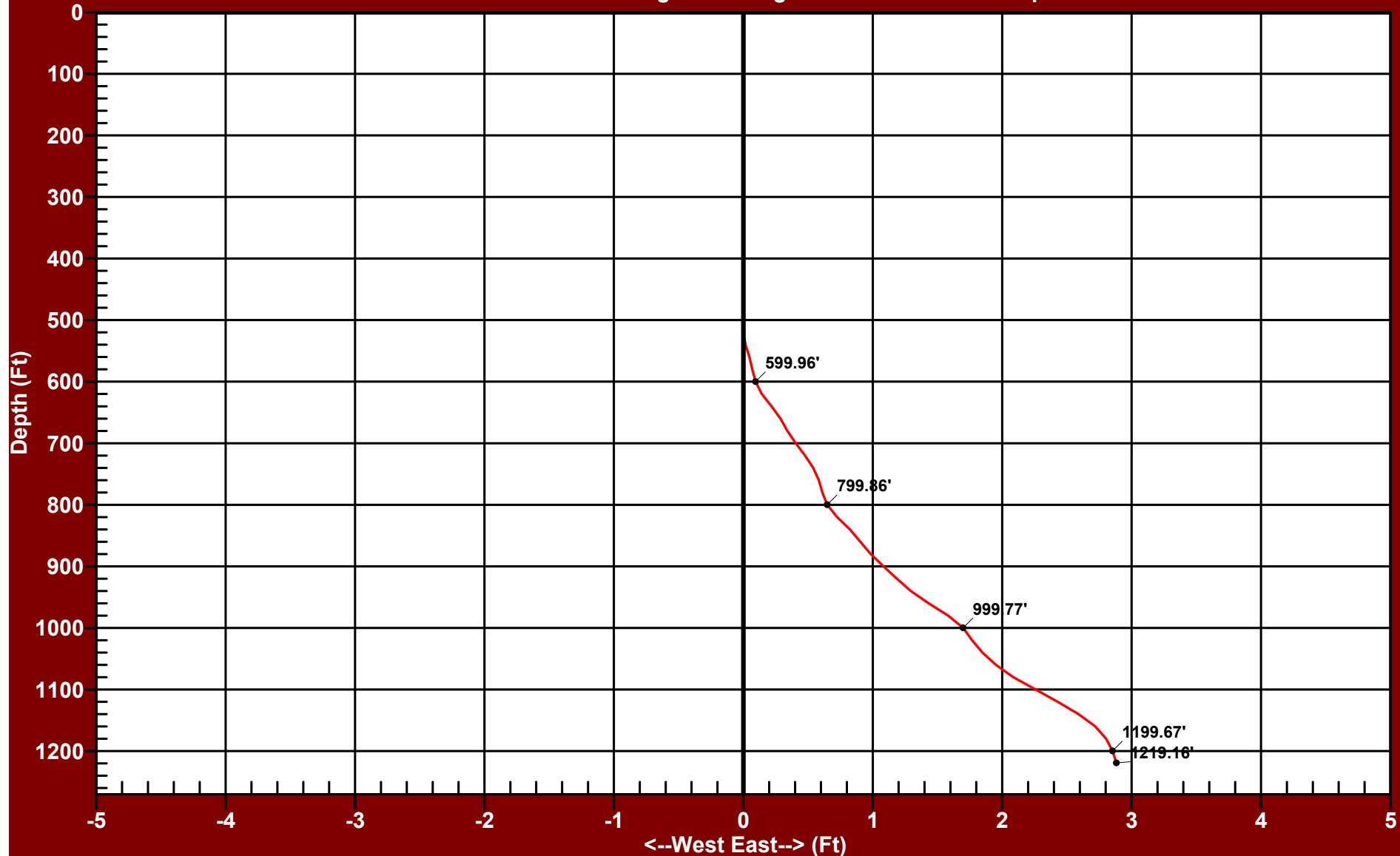
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

EASTING RECTANGULAR VIEW - I-02

FLORENCE COPPER

Drift Distance = 2.90 Feet Drift Bearing = 95.8 Degrees True Vertical Depth = 1219.16 Feet



Date of Survey: Saturday - February 17, 2018

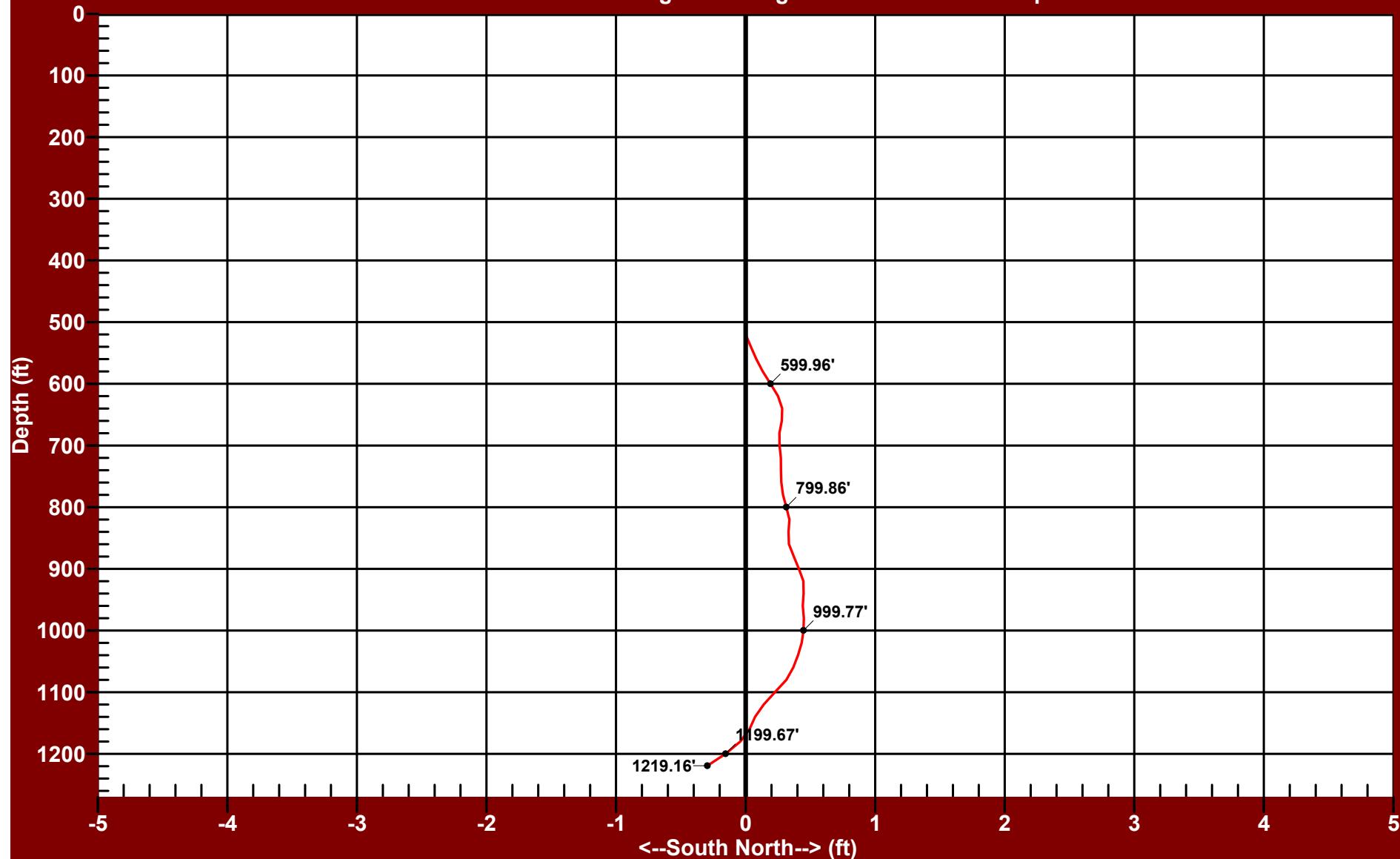
Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

NORTHING RECTANGULAR VIEW - I-02

FLORENCE COPPER

Drift Distance = 2.90 Feet Drift Bearing = 95.8 Degrees True Vertical Depth = 1219.16 Feet



Date of Survey: Saturday - February 17, 2018

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558



Services, LLC

borehole geophysics & video services

borehole geophysics & video services



Services, LLC
borehole geophysics & video services

Tool Summary:

Date	3-23-18	Date	3-23-18	Date	3-23-18
Run No.	1	Run No.	2	Run No.	3
Tool Model	MSI COMBO TOOL	Tool Model	ALT 4 RX SONIC	Tool Model	COMPROBB
Tool SN	5543	Tool SN	4572	Tool SN	6009
From	SURFACE	From	220 FT.	From	SURFACE
To	1200 FT.	To	1200 FT.	To	1200 FT.
Recorded By	A. OLSON	Recorded By	A. OLSON	Recorded By	A. OLSON
Truck No	750	Truck No	750	Truck No	750
Operation Check	3-22-18	Operation Check	3-22-18	Operation Check	3-22-18
Calibration Check	3-22-18	Calibration Check	N/A	Calibration Check	N/A
Time Logged	11:00 A.M.	Time Logged	12:00 P.M.	Time Logged	12:45 P.M.

Date	3-23-18	Date		Date	
Run No.	4	Run No.	5	Run No.	6
Tool Model	ALT QL DENSITY	Tool Model		Tool Model	
Tool SN	6187	Tool SN		Tool SN	
From	SURFACE	From		From	
To	1200 FT.	To		To	
Recorded By	A. OLSON	Recorded By		Recorded By	
Truck No	750	Truck No		Truck No	
Operation Check	3-22-18	Operation Check		Operation Check	
Calibration Check	3-22-18	Calibration Check		Calibration Check	
Time Logged	1:25 P.M.	Time Logged		Time Logged	

Additional Comments:

Caliper Arms Used: 9 IN.

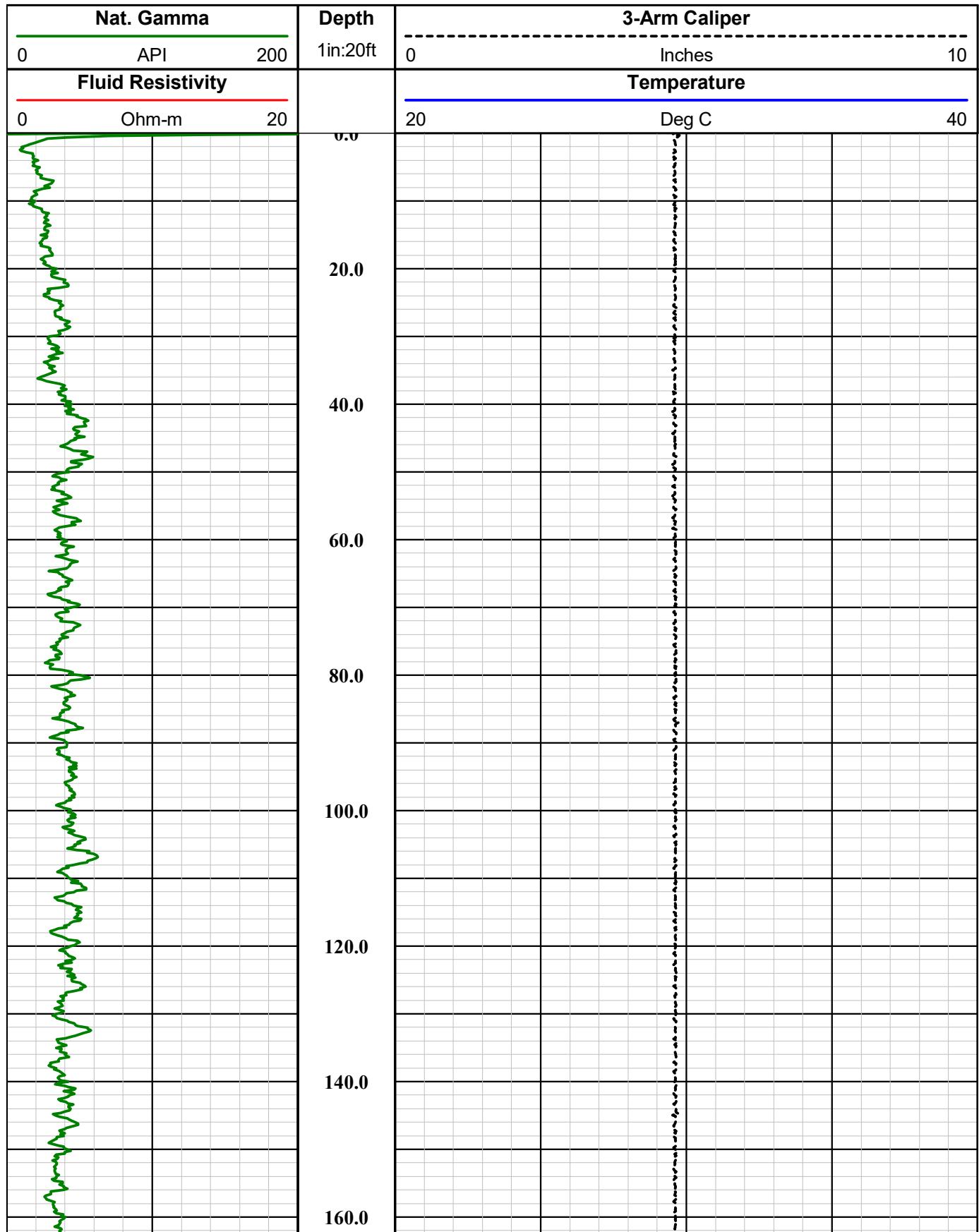
Vibration Points: _____ 4 IN. & 12 IN. _____

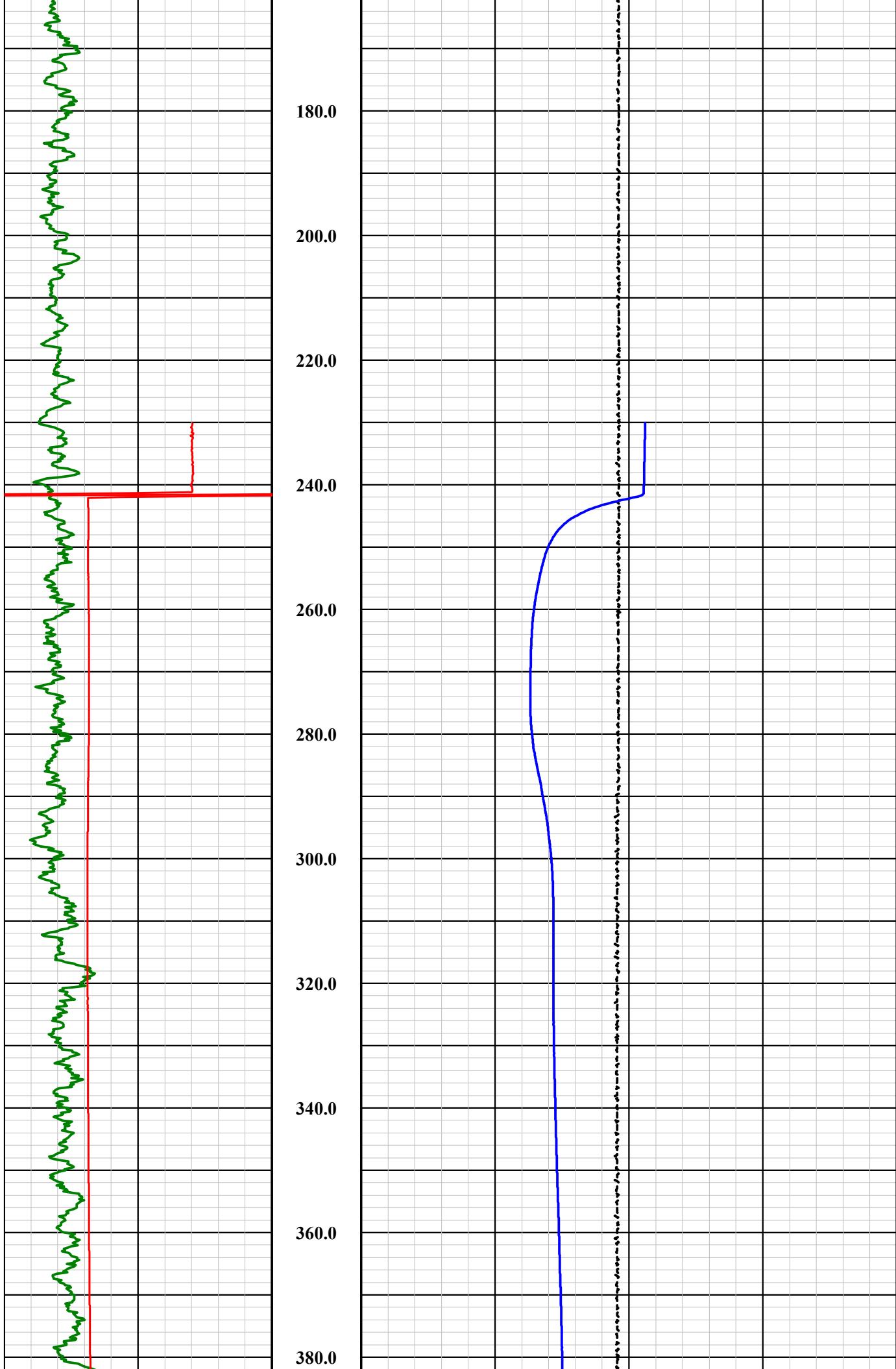
E-Log Calibration Range: N/A

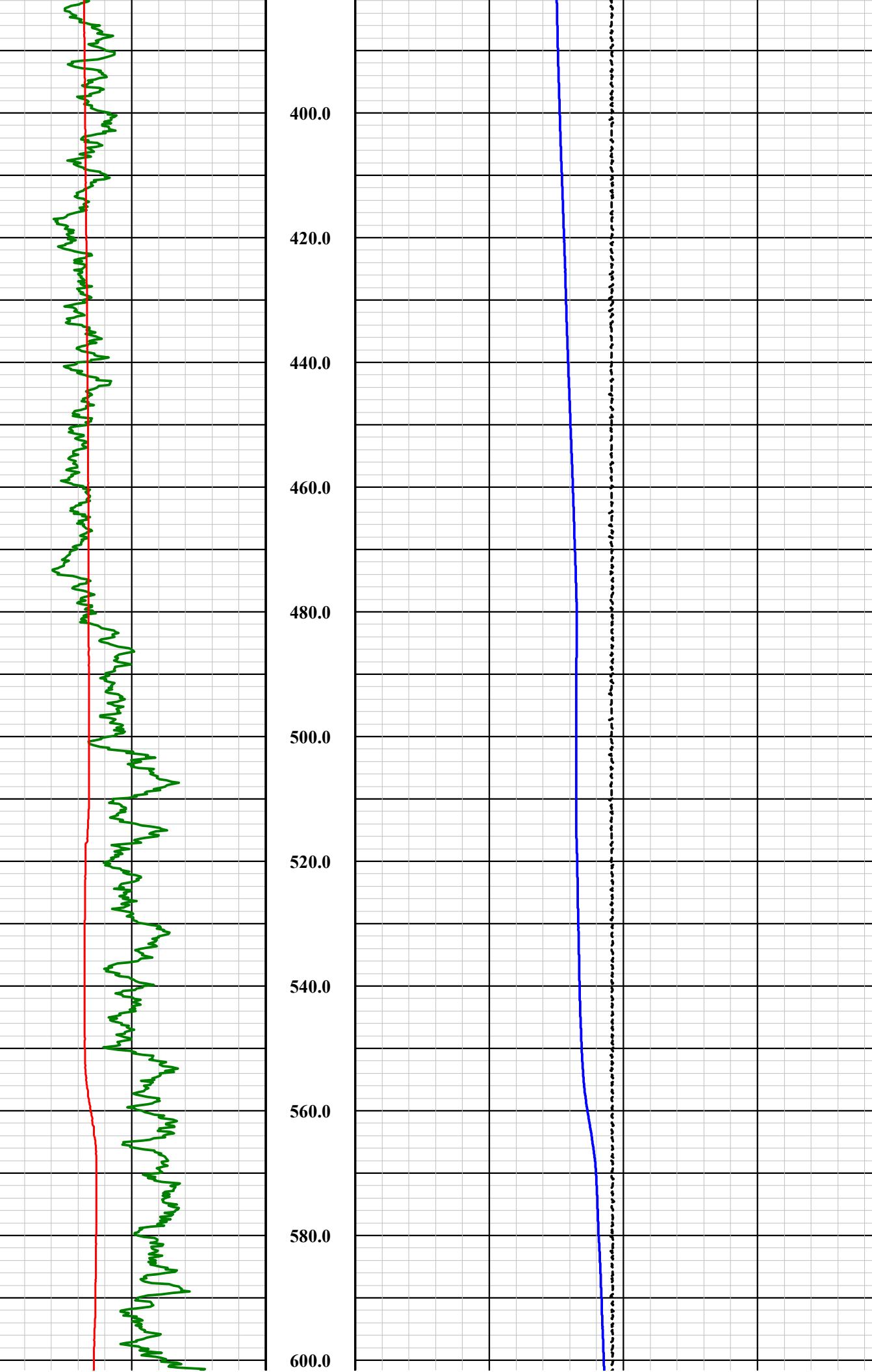
Calibration Points: N/A

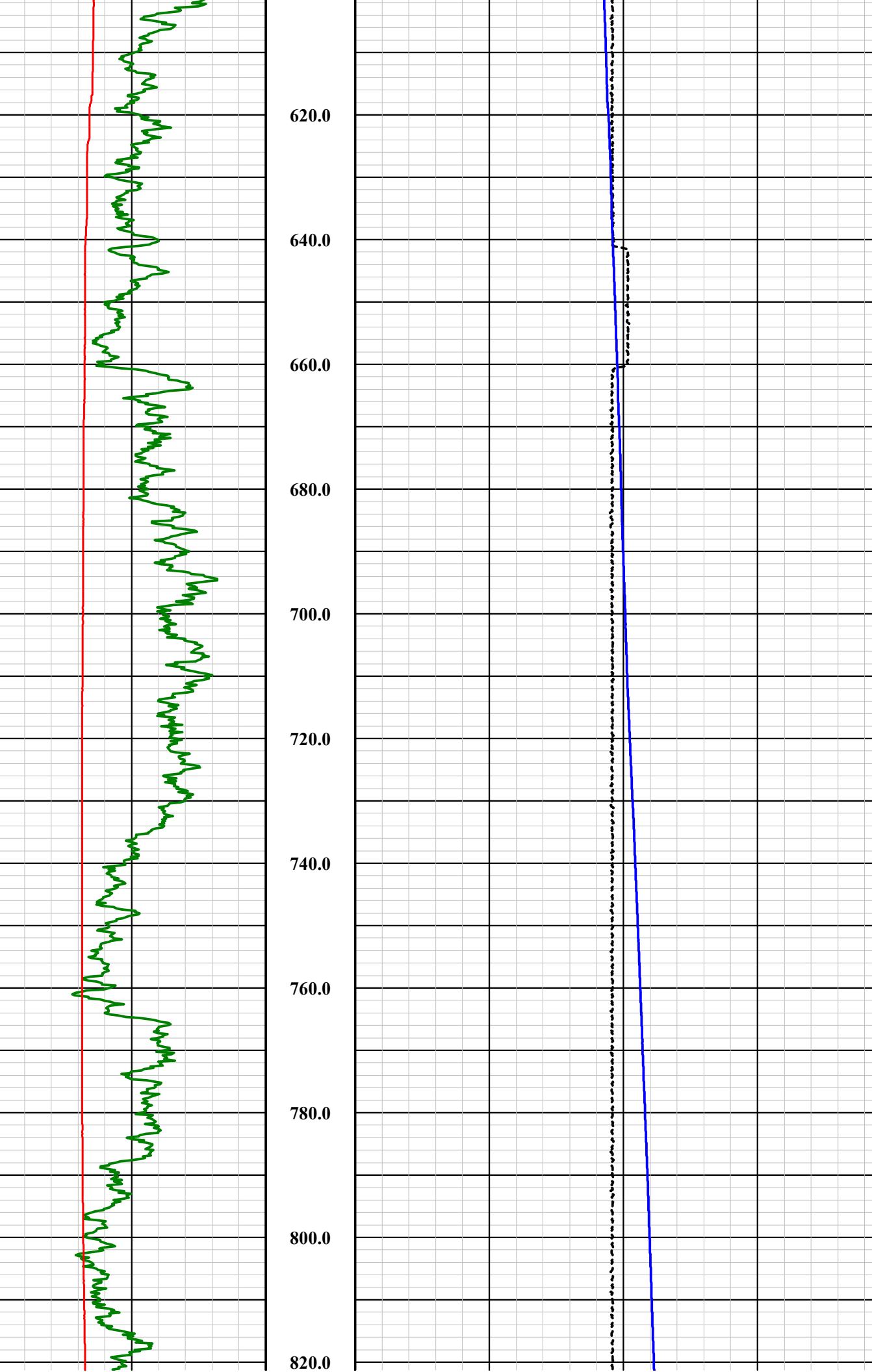
Disclaimer:

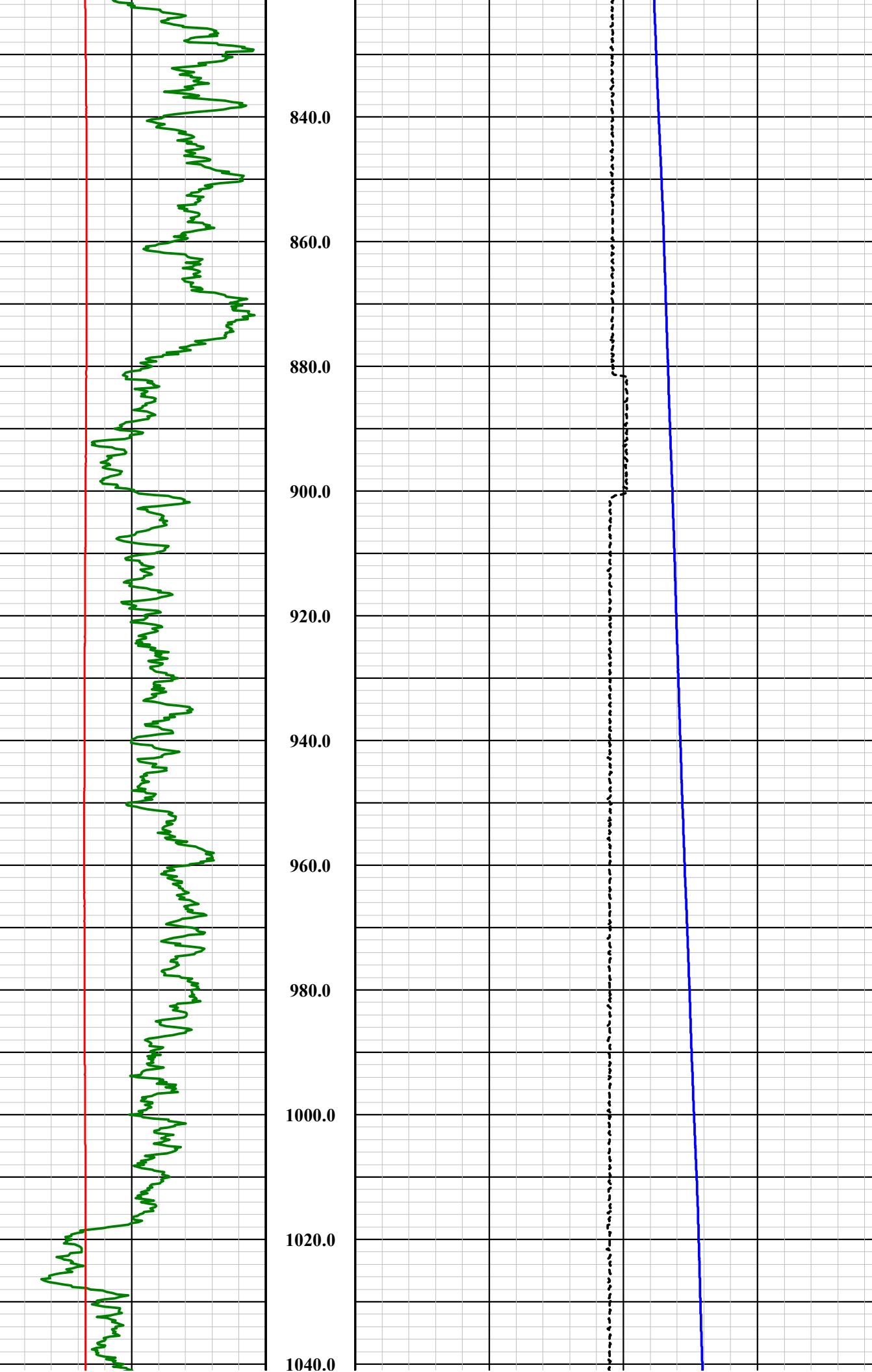
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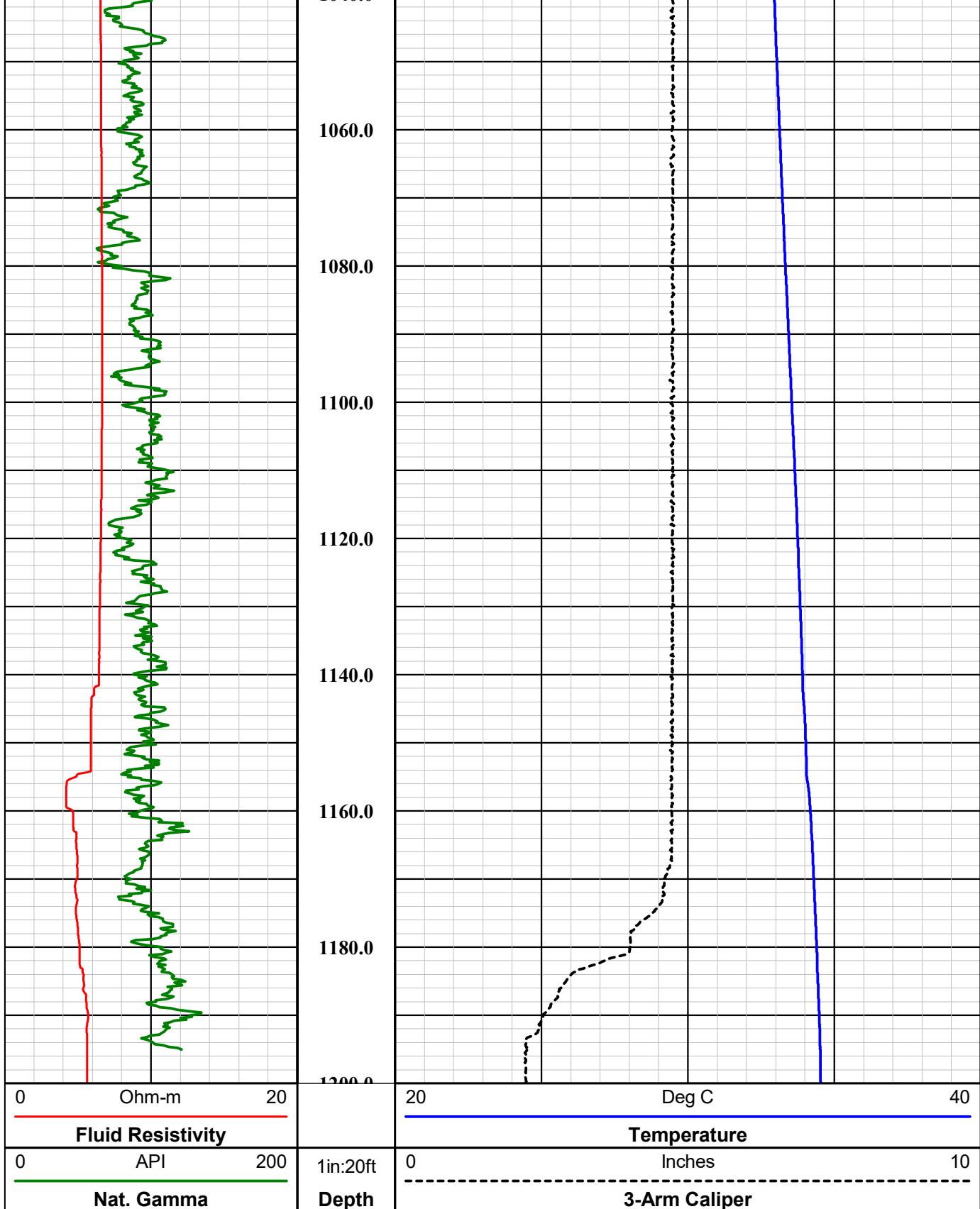












MSI Gamma-Caliper-Temperature-Fluid Resistivity

Probe Top = Depth Ref.



Single Conductor MSI Probe Top

Probe Length = 2.59 m or 8.5 ft

Probe Weight = 6.80 kg or 15.0 lbs

Natural Gamma and Caliper can only be collected logging up hole.

Fluid Temperature/Resistivity can only be collected logging down hole.

Temperature Rating: 70 Deg C (158 Deg F)

Pressure Rating: 200 bar (2900 psi)

Natural Gamma Ray = 0.76 m (29.75 in)

NOTE: Lengths on a particular tool may vary from those listed on this document due to probe sizes and styles utilized

3-Arm Caliper = 1.44 m (56.75 in)

Distance from tool top: 2.20 m (86.5 in)

Available Arm Sizes: 3", 9", and 15"

TFR (Temperature/Fluid Resistivity) = 0.39 m (15.5 in)

1.375" or 34.9 mm Diameter

APPENDIX F

SAPT Documentation

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
STANDARD ANNULAR PRESSURE TEST

Operator FLORENCE COPPER, INC
 Address 1575 W. HUNT HWY
FLORENCE, AZ 85132

Well Name I-02
 State Permit No. P-101704

LOCATION INFORMATION SW Quarter of the NE Quarter of the SW Quarter
 of Section 28; Range 9E; Township 4S; County PINAL;
 Company Representative IAN REAM; Field Inspector LAUREN CANDREVA;
 Type of Pressure Gauge with data logger inch face; 300 psi full scale; 0.001 psi increments;

New Gauge? Yes No If no, date of calibration Calibration certification submitted? Yes No

TEST RESULTS

Readings must be taken at least every 10 minutes for a minimum of 30 minutes for Class II, III and V wells and 60 minutes for Class I wells.

For Class II wells, annulus pressure should be at least 300 psig. For Class I wells, annulus pressure should be the greater of 300 psig or 100 psi above maximum permitted injection pressure.

Original chart recordings must be submitted with this form.

5-year or annual test on time? Yes No

2-year test for TA'd wells on time? Yes No

After rework? Yes No

Newly permitted well? Yes No

Pressure (in psig)		
Time	Annulus	Tubing
09:15	166.63	same
09:25	166.03	same
09:35	165.74	same
09:45	165.47	same

Casing size 5" - NOMINAL

Tubing size 2"

Packer type INFLATABLE PACKER

Packer set @ 6.69(top), 505.83(bottom)

Top of Permitted Injection Zone 420 feet

Is packer 100 ft or less above top of

Injection Zone? Yes No

If not, please submit a justification.

Fluid return (gal.) 0.41

Comments: Test conducted three times to confirm results, data

for all test included in attached chart and table

Test Pressures: Max. Allowable Pressure Change: Initial test pressure x 0.05 8.33 psi

Test Period Pressure change 1.16 psi

Test Passed

Test Failed

If failed test, well must be shut in, no injection can occur, and USEPA must be contacted within 24 hours. Corrective action needs to occur, the well retested, and written authorization received before injection can recommence.

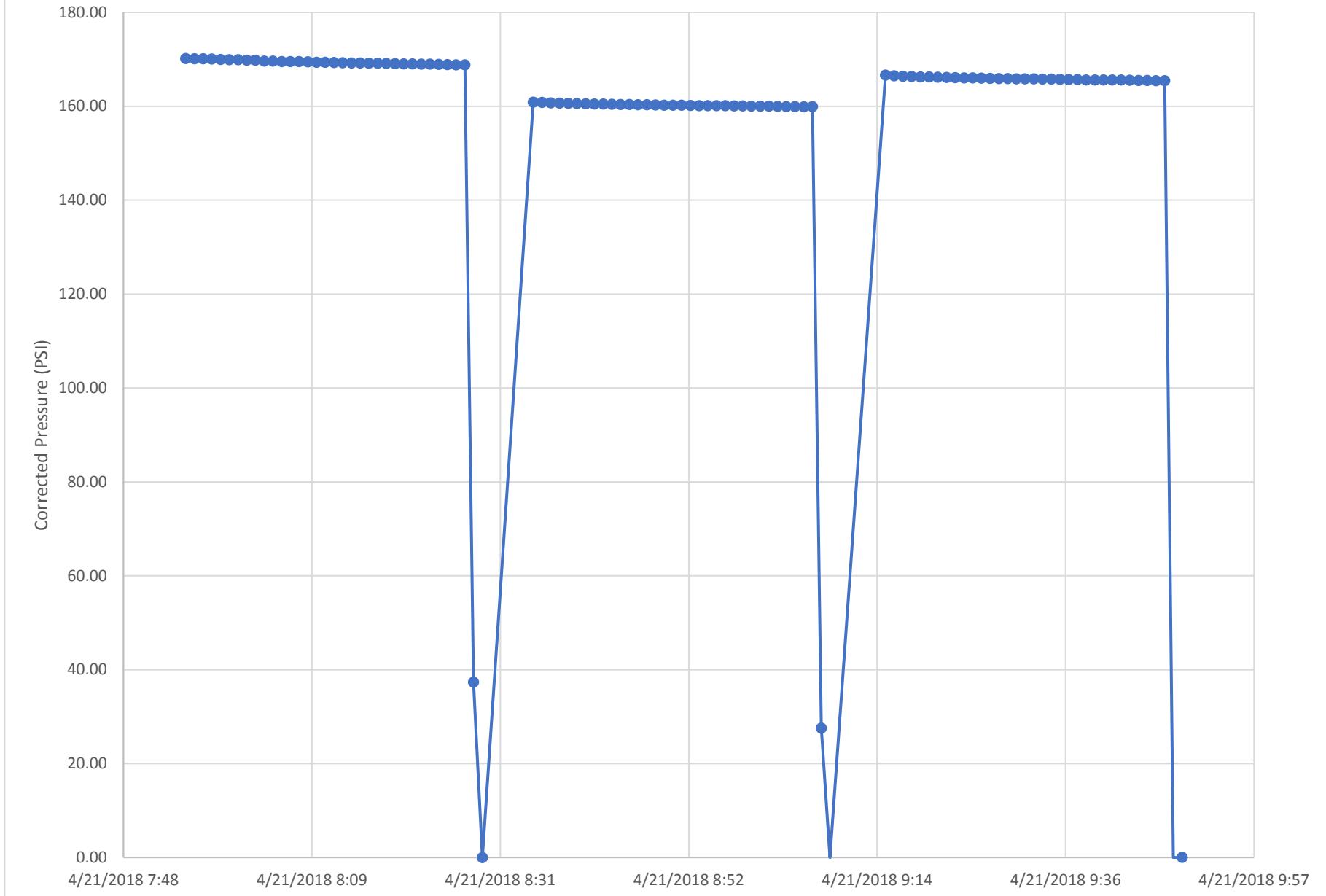
I certify under penalty of law that this document and all attachments are, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. (See 40 CFR 144.32(d))

Tan Ream
 Printed Name of Company Representative


 Signature of Company Representative

9-13-2018
 Date

I-02 Standard Annular Pressure Test Data



Well I-02 SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
4/21/2018 7:55	184.134	170.15
4/21/2018 7:56	184.106	170.12
4/21/2018 7:57	184.096	170.11
4/21/2018 7:58	184.037	170.05
4/21/2018 7:59	183.968	169.98
4/21/2018 8:00	183.911	169.93
4/21/2018 8:01	183.916	169.93
4/21/2018 8:02	183.827	169.84
4/21/2018 8:03	183.798	169.81
4/21/2018 8:04	183.63	169.64
4/21/2018 8:05	183.584	169.60
4/21/2018 8:06	183.523	169.54
4/21/2018 8:07	183.517	169.53
4/21/2018 8:08	183.501	169.52
4/21/2018 8:09	183.44	169.45
4/21/2018 8:10	183.374	169.39
4/21/2018 8:11	183.347	169.36
4/21/2018 8:12	183.316	169.33
4/21/2018 8:13	183.273	169.29
4/21/2018 8:14	183.21	169.22
4/21/2018 8:15	183.2	169.21
4/21/2018 8:16	183.18	169.19
4/21/2018 8:17	183.149	169.16
4/21/2018 8:18	183.114	169.13
4/21/2018 8:19	183.08	169.09
4/21/2018 8:20	182.992	169.01
4/21/2018 8:21	182.99	169.00
4/21/2018 8:22	182.973	168.99
4/21/2018 8:23	182.935	168.95
4/21/2018 8:24	182.911	168.93
4/21/2018 8:25	182.877	168.89
4/21/2018 8:26	182.828	168.84
4/21/2018 8:27	182.796	168.81
4/21/2018 8:28	51.351	37.37
4/21/2018 8:29	13.986	0.00
4/21/2018 8:34	174.87	160.88
4/21/2018 8:35	174.81	160.82
4/21/2018 8:36	174.70	160.72
4/21/2018 8:37	174.64	160.66
4/21/2018 8:38	174.60	160.61

Well I-02 SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
4/21/2018 8:39	174.55	160.57
4/21/2018 8:40	174.51	160.52
4/21/2018 8:41	174.48	160.49
4/21/2018 8:42	174.45	160.47
4/21/2018 8:43	174.42	160.44
4/21/2018 8:44	174.37	160.38
4/21/2018 8:45	174.38	160.40
4/21/2018 8:46	174.30	160.32
4/21/2018 8:47	174.30	160.31
4/21/2018 8:48	174.28	160.29
4/21/2018 8:49	174.23	160.24
4/21/2018 8:50	174.20	160.21
4/21/2018 8:51	174.22	160.24
4/21/2018 8:52	174.17	160.18
4/21/2018 8:53	174.14	160.15
4/21/2018 8:54	174.12	160.13
4/21/2018 8:55	174.09	160.11
4/21/2018 8:56	174.10	160.11
4/21/2018 8:57	174.09	160.10
4/21/2018 8:58	174.07	160.09
4/21/2018 8:59	174.01	160.03
4/21/2018 9:00	174.03	160.05
4/21/2018 9:01	174.03	160.04
4/21/2018 9:02	173.96	159.97
4/21/2018 9:03	173.94	159.95
4/21/2018 9:04	173.92	159.94
4/21/2018 9:05	173.89	159.90
4/21/2018 9:06	173.90	159.91
4/21/2018 9:07	41.56	27.57
4/21/2018 9:08	13.99	0.00
4/21/2018 9:15	180.611	166.63
4/21/2018 9:16	180.481	166.50
4/21/2018 9:17	180.384	166.40
4/21/2018 9:18	180.335	166.35
4/21/2018 9:19	180.248	166.26
4/21/2018 9:20	180.213	166.23
4/21/2018 9:21	180.18	166.19
4/21/2018 9:22	180.108	166.12
4/21/2018 9:23	180.091	166.11
4/21/2018 9:24	180.041	166.06

Well I-02 SAPT Data		
Tranducer Serial Number:	519257	
Tranducer Model:	Level TROLL 400 non-vented 300 psi	
Date and Time	Pressure (PSI)	Corrected Presssure (PSI) (Sensor pressure - barometric pressure)
4/21/2018 9:25	180.019	166.03
4/21/2018 9:26	179.974	165.99
4/21/2018 9:27	179.947	165.96
4/21/2018 9:28	179.9	165.91
4/21/2018 9:29	179.88	165.89
4/21/2018 9:30	179.838	165.85
4/21/2018 9:31	179.84	165.85
4/21/2018 9:32	179.808	165.82
4/21/2018 9:33	179.787	165.80
4/21/2018 9:34	179.756	165.77
4/21/2018 9:35	179.726	165.74
4/21/2018 9:36	179.69	165.70
4/21/2018 9:37	179.672	165.69
4/21/2018 9:38	179.604	165.62
4/21/2018 9:39	179.574	165.59
4/21/2018 9:40	179.571	165.59
4/21/2018 9:41	179.564	165.58
4/21/2018 9:42	179.565	165.58
4/21/2018 9:43	179.514	165.53
4/21/2018 9:44	179.497	165.51
4/21/2018 9:45	179.457	165.47
4/21/2018 9:46	179.439	165.45
4/21/2018 9:47	179.438	165.45
4/21/2018 9:48	13.982	0.00
4/21/2018 9:49	13.999	0.01

APPENDIX G

Cement Bond Log Summary

WELL I-02

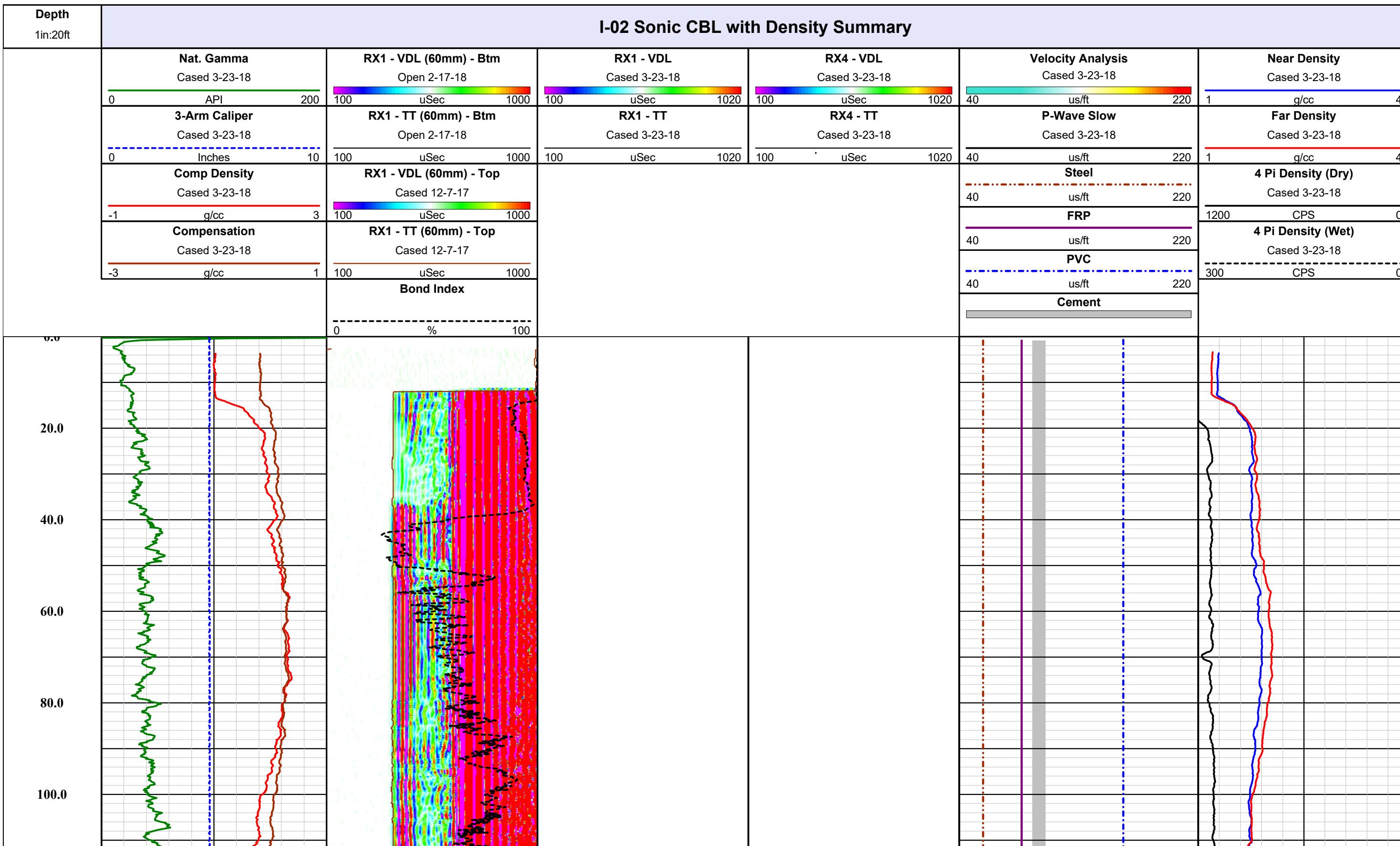
Geophysical Log Summary

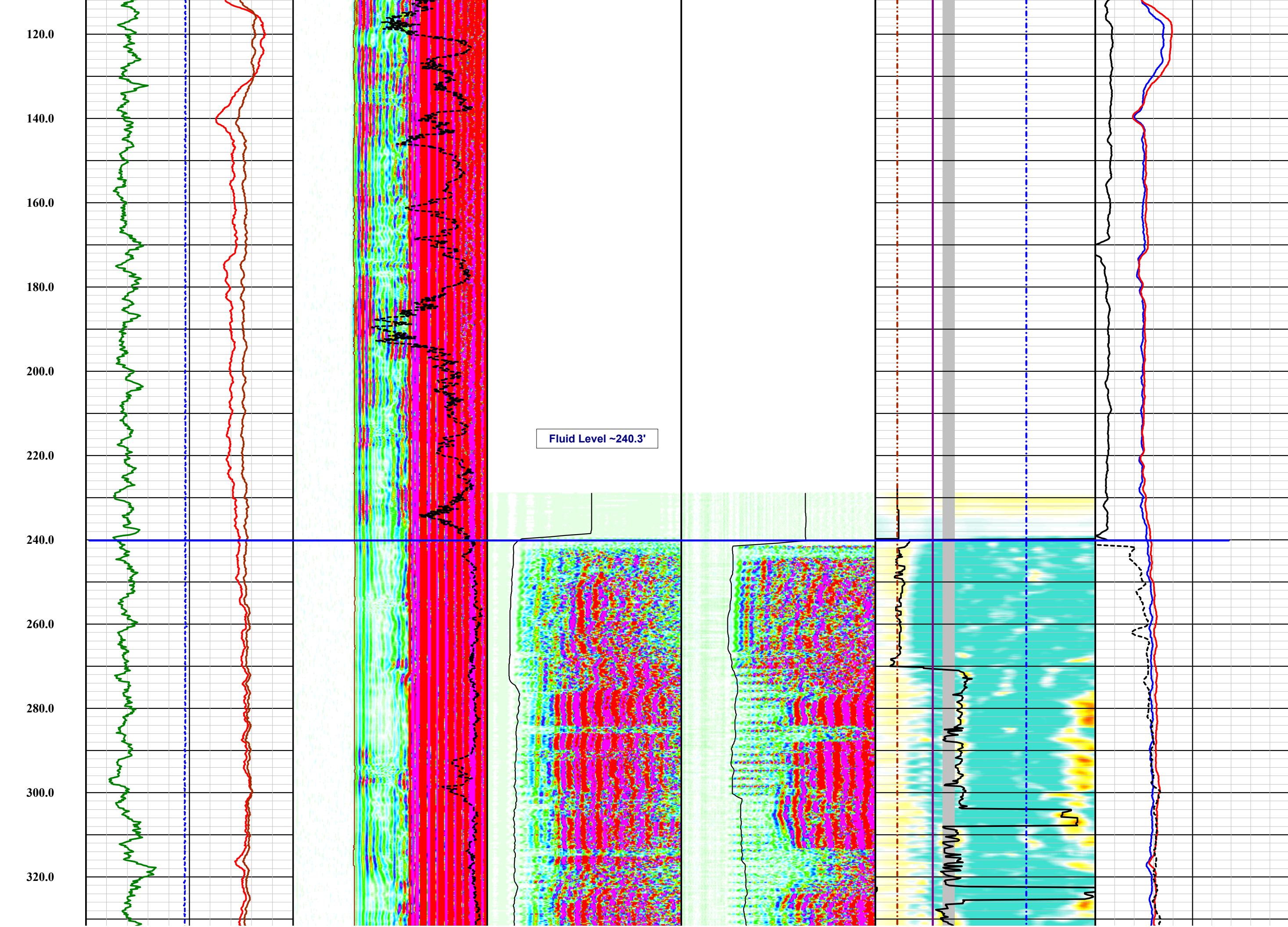

Southwest Exploration Services, LLC
 borehole geophysics & video services

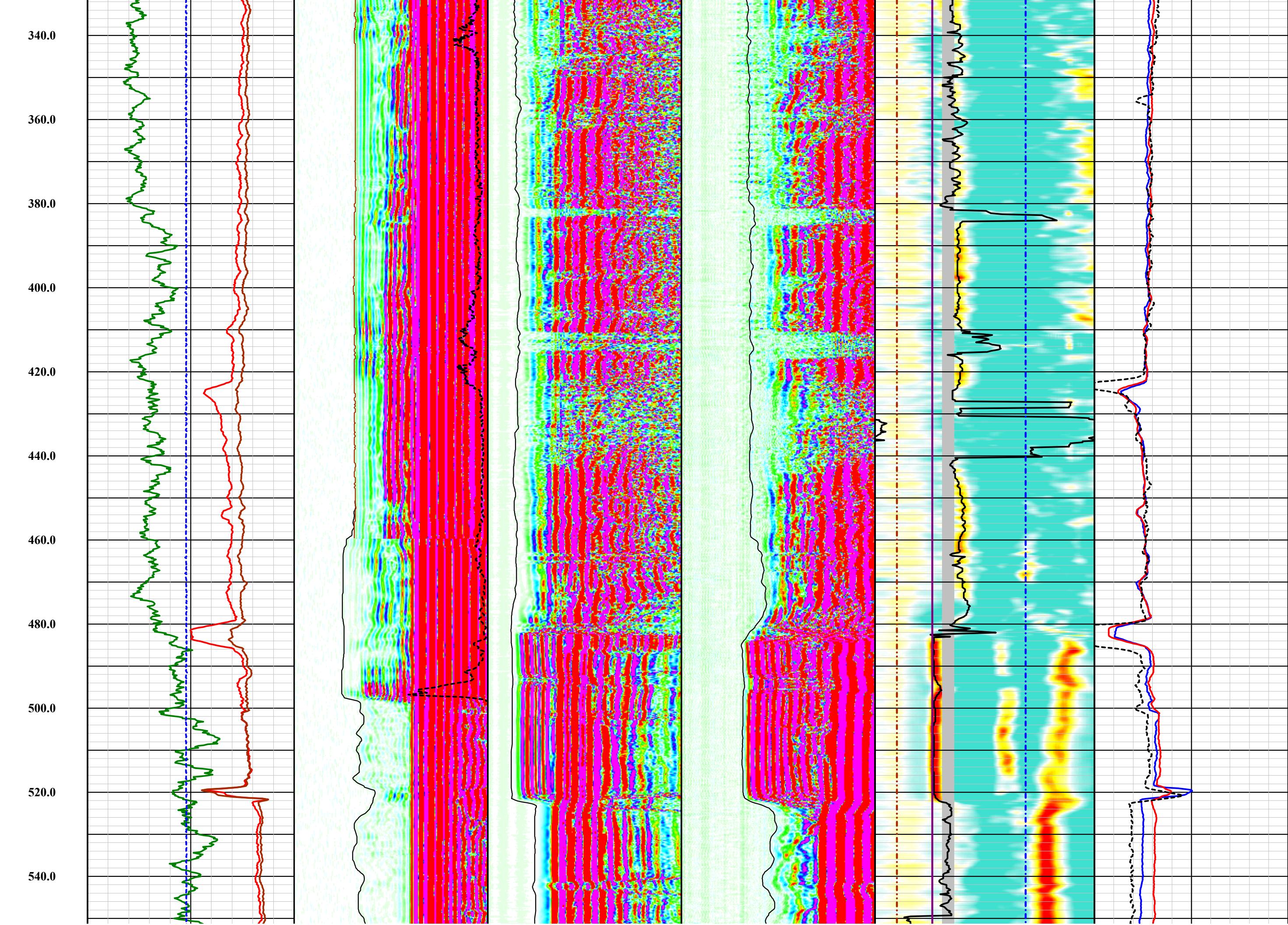
 COMPANY: FLORENCE COPPER COMPANY
 FIELD: FLORENCE COPPER SITE
 WELL ID: I-02
 COUNTY: PINAL

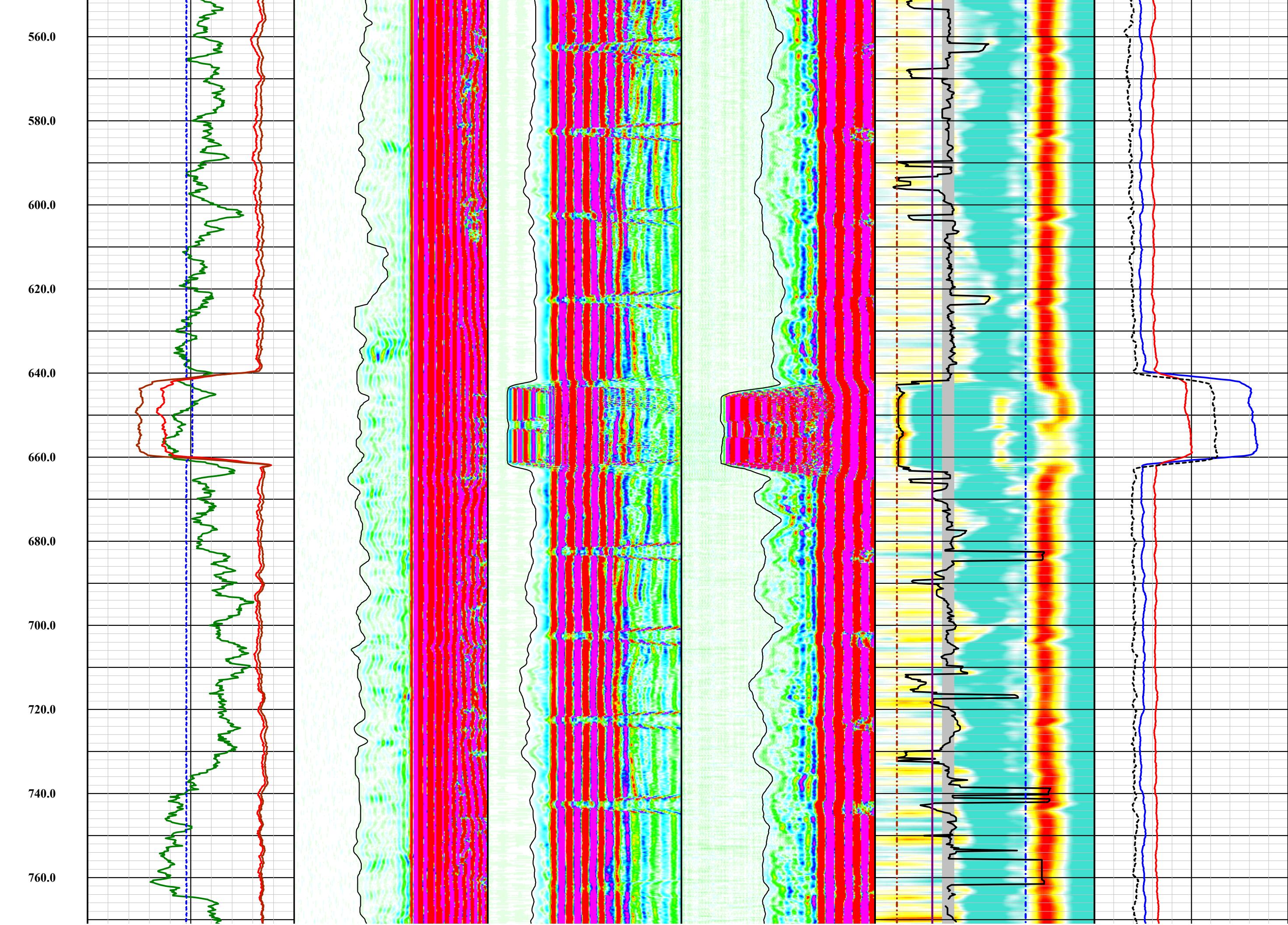
STATE: ARIZONA

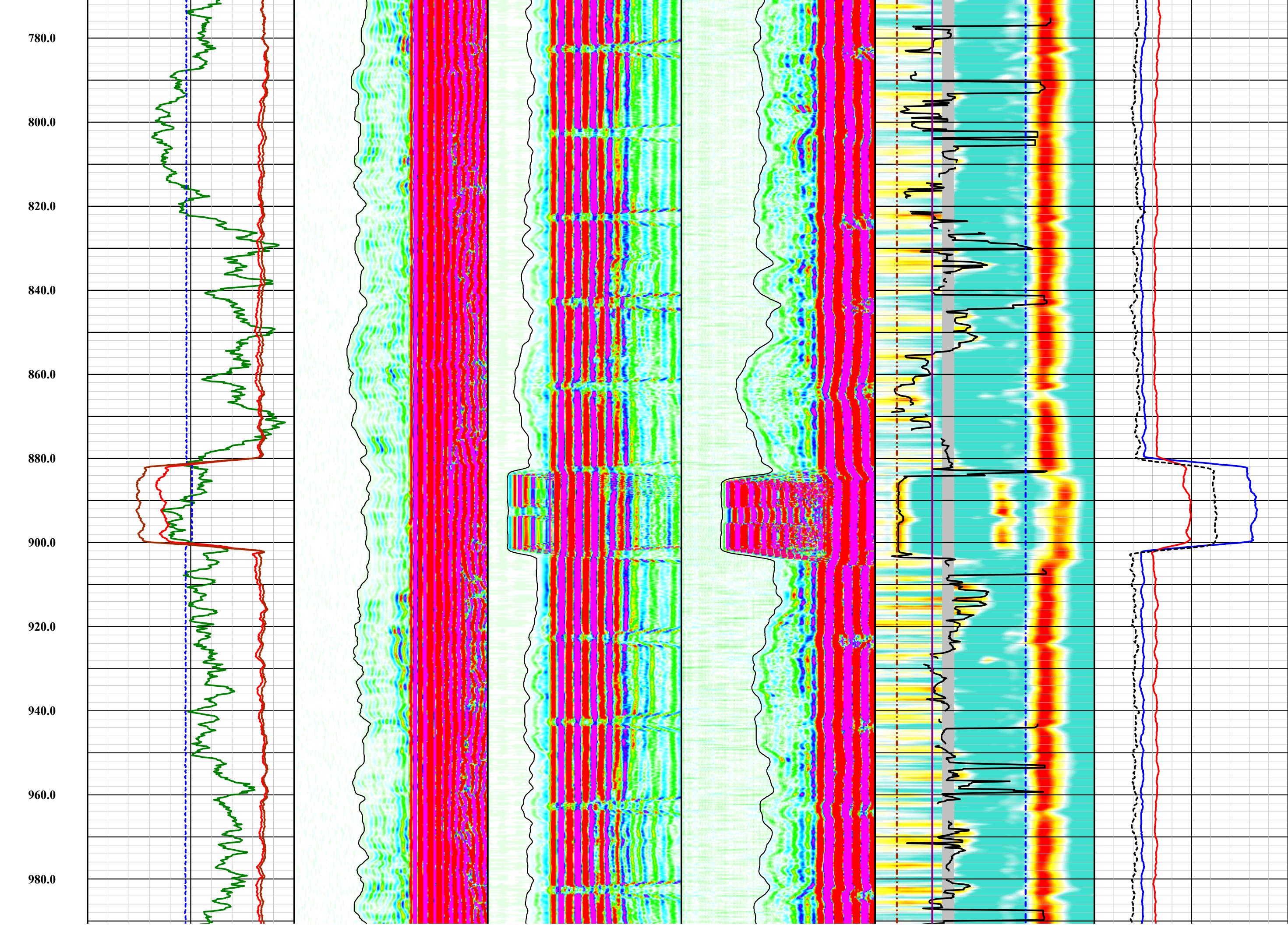
 Logging Engineer: VARIOUS
 Date Logged: VARIOUS
 Processed By: K.M / B.C.
 Date Processed: 07-18-18

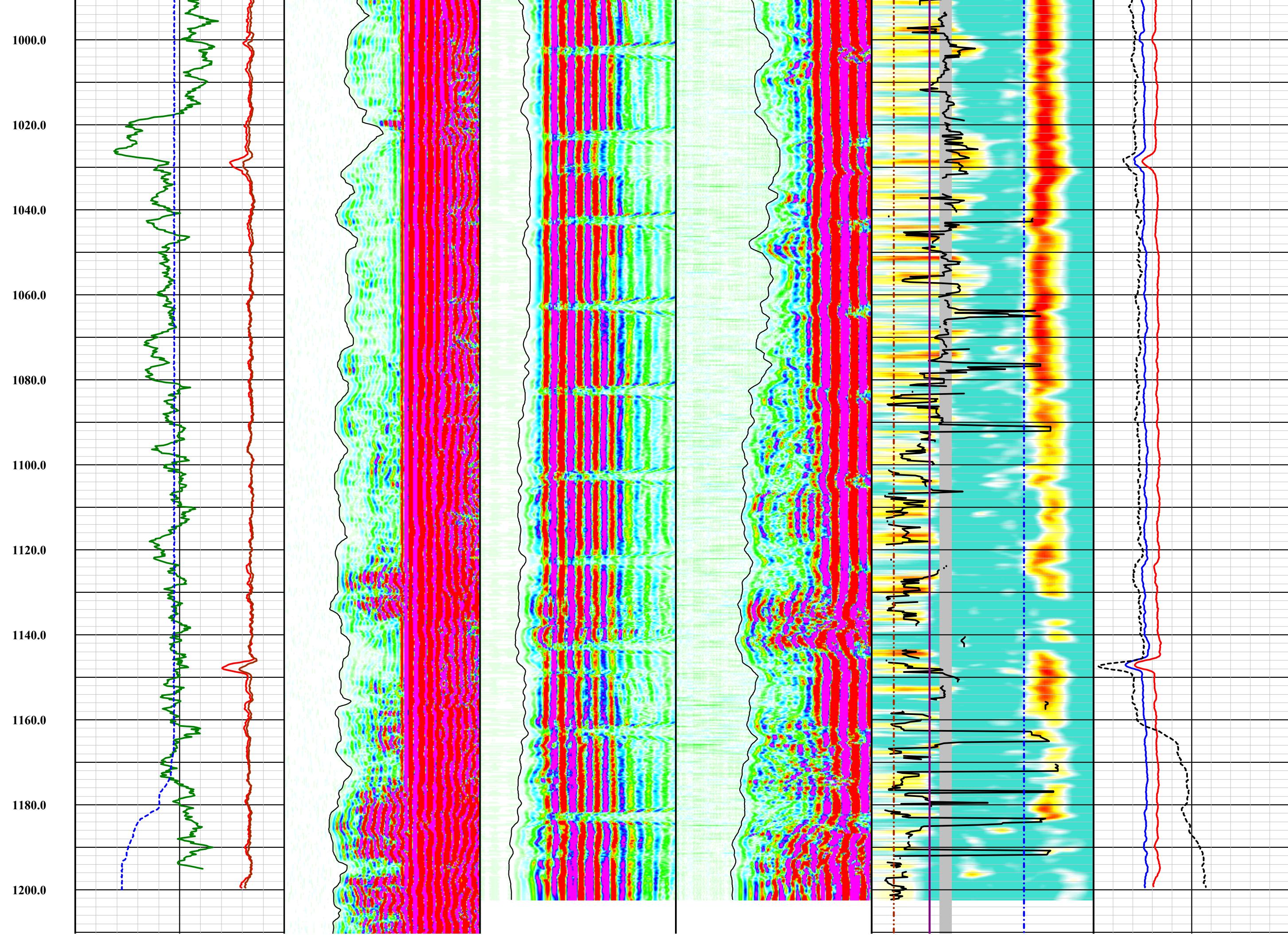



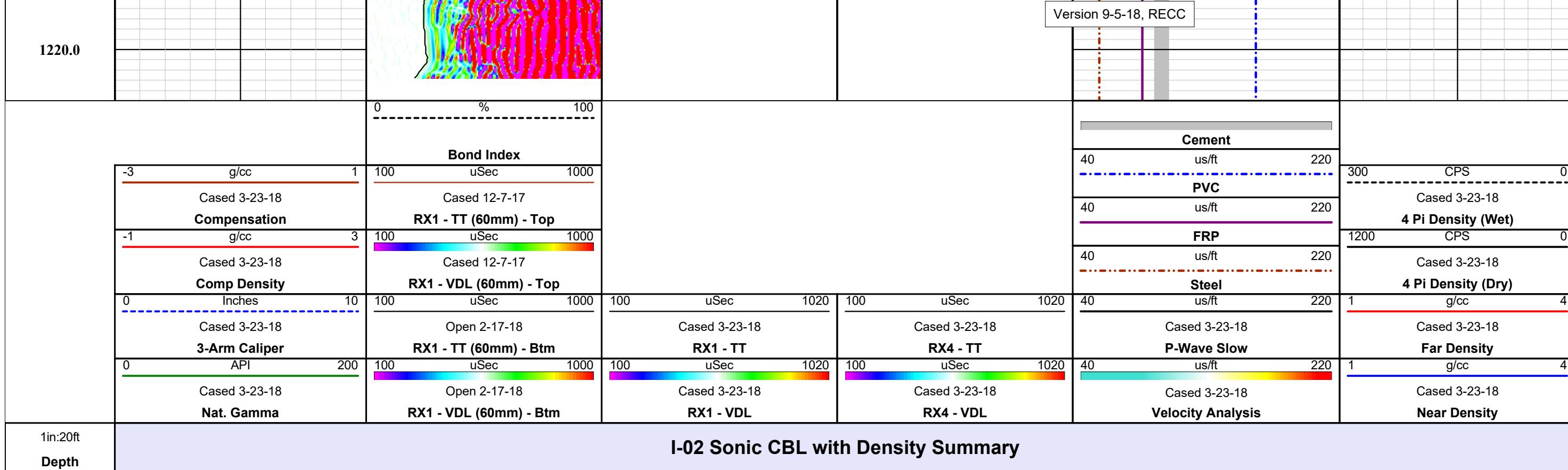












APPENDIX H

Well Development Field Forms

**DEVELOPMENT
FIELD DATA LOG**

Project Name: <u>FLI</u>	Project No.: <u>129687</u>
Well No.: <u>I-02</u>	Date: <u>3-3-18</u>
Location: <u>FLORENCE AZ</u>	Measuring Point: <u>A130/mixing</u>
Total Depth of Well (ft bbls): <u>1200</u>	Screen Interval (ft bbls): <u>~500 - 1700</u>
Pump Type/Setting (ft bbls): <u>Airlift</u>	Activity: <u>Airlift</u>
How Q Measured: <u>Core / 1/4" wadth</u>	H&A Personnel: <u>KFord</u>

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{mos}/\text{cm}$)	Temp. °C	Turbidity NTU	Comments
		<u>Set airline @</u>	<u>422</u>	<u>3.78</u>					
0902	Start	airlift							
0905	1.6	422	-	0.1	7.14	2910	16.86	OR.	Brown, cloudy.
0920	1.6	422	-	0.0	7.49	2742	18.66	OR.	Grey, cloudy.
0935	1.6	422	-	0.0	7.99	2745	20.24	OR	"
0950	1.6	422	-	0.0	8.16	2778	21.10	OR	Greyish-brown, cloudy
1005	1.6	422	-	0.0	8.26	2751	21.25	OR.	Lt. greyish-brn, cloudy
1020	1.6	422	-	0.0	8.26	2736	21.65	OR.	"
1030	1.6	422	-	0.0	8.26	2716	21.88	900	"
1040	1.6	422	-	0.0	8.32	2695	22.03	581	"
1050	1.6	422	-	0.0	8.30	2679	22.19	437	"
1100	1.6	422	-	0.0	8.33	2664	22.28	307	lt grey, st. cloudy
1110	1.6	422	-	0.0	8.32	2655	22.54	257	"
1125	1.6	422	-	0.0	8.37	2675	22.79	217	"
1140	1.6	422	-	0.0	8.36	2686	22.97	191	"
1155	1.6	422	-	0.0	8.37	2667	22.66	143	"
1210	1.6	422	-	0.0	8.35	2684	23.11	127	" v.st. cloudy
1225	1.6	422	-	0.0	8.40	2678	23.06	111	"
1230	OFF								
	MOVE	EDUCTOR	TO 617 AIRLINE @ 420 ft.						
1317	Start	airlift							
1319	1.7	617	-	0.1	7.94	2836	24.47	OR	Brown, cloudy.
1335	1.7	617	-	0.4	8.19	2758	23.09	OR	"
1350	1.7	617	-	0.0	8.23	2831	23.56	OR	"
1405	1.7	617	-	<0.1	8.30	2719	23.09	OR.	lt brown, st. cloudy
1420	1.7	617	-	0.0	8.35	2685	22.96	543	lt brown, st. cloudy
1430	1.7	617	-	0.0	8.29	2672	23.14	564	"
1445	1.7	617	-	0.0	8.27	2658	22.94	386	"

Comments:

**DEVELOPMENT
FIELD DATA LOG**

Project Name: FUE	Project No.: 129687
Well No.: I-02	Date: 3-3-18 - 3/4/18
Location: FLORENCE AZ	Measuring Point: DISILARALE
Total Depth of Well (ft bbls): 1700	Screen Interval (ft bbls): ~500 - 1700
Pump Type/Setting (ft bbls): (variable)	Activity: AIRLIFT
How Q Measured: (none) stopwatch	H&A Personnel: H. A. KERD

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{mos}/\text{cm}$)	Temp. °C	Turbidity NTU	Comments
1500	1.7	617	--	0.0	8.31	2644	22.90	468	v.lt. brown, sl. cloudy
1515	1.7	617	-	0.0	8.33	2633	22.75	389	"
1530	1.7	617	-	0.0	8.33	2626	22.72	85.1	Clear
1535	STOP AIRLIFTING	-	-	-	-	-	-	-	-
-	MOVE EJECTOR TO	810, AIRLINE 525	-	-	-	-	-	-	-
1629	START AIRLIFT	-	-	-	-	-	-	-	-
1630	~4	810	-	0.1	8.01	2737	22.60	204	lt brown, sl. cloudy
1645	~4	810	-	0.1	8.28	2781	22.54	OR.	Brown, cloudy
1700	~4	810	-	0.5	8.25	2712	22.48	852	Brown, sl. cloudy
1715	~4	810	-	0.3	8.25	2599	22.55	453	lt brown, sl. cloudy
1730	~4	810	-	0.1	8.28	2581	22.45	148	v.lt brown, v.sl. cloudy
1745	~4	810	-	0.0	8.29	2563	22.32	97.6	v.sl. cloudy
1747	STOP AIRLIFTING	-	-	-	-	-	-	-	-
0715	9.20 AM	AIRLIFTING	-	-	-	-	-	-	-
0720	1004	-	0.1	7.32	2326	16.96	73.7	Very cloudy	
0745	Stop	AIRLIFTING	-	-	-	-	-	-	Pump off
0845	Start	AIRLIFTING	-	-	-	-	-	-	-
0900	1004	-	opaque	8.02	2407	19.87	overcast	Cloudy	Brown, opaque
0920	0.6	1004	-	opaque	7.95	2359	20.74	overcast	Brown, opaque
0950	0.9	1004	-	opaque	7.95	2390	20.89	overcast	Brown, opaque
1015	0.9	1004	-	0.2	8.06	2616	22.83	overcast	Brown, opaque
1110	0.9	1004	-	0.0	8.10	2676	23.75	710	Brown, cloudy
1140	1.2	1004	-	0.0	8.07	2571	23.12	overcast	Brown, cloudy, opaque
1205	1.5	1004	-	0.2	8.10	2671	23.52	408	Brown, cloudy
1225	1.5	1004	-	0.2	8.06	2556	23.38	323	Cloudy
1245	3.2	1004	-	0.0	8.06	2534	23.60	64.3	clear
1300	3.2	1004	-	1.5	8.05	2526	23.48	overcast	brown, opaque
1320	1004	-	2.5	8.08	2627	23.68	793	-	brown, cloudy

Comments:

**PUMPING TEST/DEVELOPMENT
FIELD DATA LOG**

Project Name: FLS PTF	Project No.: 128487-007
Well No.: I-02	Date: 3/4/18 - 3/5/18
Location: Florence, AZ	Measuring Point: Discharge
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): ~560 - 1200
Pump Setting (ft bbls): various	Pump Type: Airlift
How Q Measured: Core / stopwatch	Personnel: S Hengel

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ml/L)	pH	Sp. Cond. (mmhos/cm)	Temp. °F	Comments
1345	5.3	1004	-	0.1	8.05	25413	23.52	Cloudy (NTU) Turbidity
1405	5.3	1004	-	0.3	8.07	25091	23.71	Cloudy 74.3
1425	5.3	1004	-	0.1	8.07	24889	23.52	clear 47.2
1445	5.3	1004	-	0.0	8.04	24881	23.58	clear 44.1
1505	5.3	1004	-	0.5	8.05	24660	23.53	brown, opaque overrange
1525	5.3	1004	-	2.5	8.05	24669	23.41	brown, cloudy 570
1540	5.3	1004	-	0.1	8.06	24779	23.15	cloudy 147
1605	5.3	1004	-	0.0	8.06	24553	23.41	clear 49.8
1625	5.1	1004	-	0.1	8.05	24446	22.94	cloudy 386
1640	5.1	1004	-	1.5	8.07	24338	23.17	cloudy 572
1700	5.1	1004	-	0.3	8.05	24338	22.75	cloudy 139
1725	5.1	1004	-	0.0	8.06	23888	22.161	clear 48.9
1730	Done	Air-lifted	-	-	-	-	-	-
3/5/18	Start	Airlift	-	-	-	-	-	-
0705	5.6	1004	-	0.0	8.19	1357	18.79	clear 30.1
0730	5.6	1004	-	0.4	8.22	1472	21.64	cloudy 108
0750	5.6	1004	-	0.1	8.26	1514	21.84	cloudy 60.2
0810	5.6	1004	-	0.0	8.24	1520	22.10	clear 32.9
0820	Done	Airlift	-	-	-	-	-	-
0835	5.8	1033	-	2.5	8.27	1502	22.82	brown, cloudy overrange
0855	5.8	1033	-	0.0	8.28	1533	22.81	clear 58.7
0925	5.8	1033	-	0.003	8.29	1532	23.27	cloudy 294
1045	5.8	1033	-	1.5	8.28	1538	23.53	clear 69.6
1105	5.8	1033	-	0.0	8.27	1547	23.69	clear 19.3
1135	5.8	1033	-	0.4	8.28	1538	23.89	clear 38.2
1200	5.3	1033	-	0purple	8.28	1534	23.73	overrange → brown opaq 1.2
1220	5.3	1033	-	0.1	8.29	1541	24.12	cloudy 153

Additional Comments:

**PUMPING TEST/DEVELOPMENT
FIELD DATA LOG**

Project Name: FCI PTF	Project No.: 1246457-007
Well No.: 2-02	Date: 3/5/18 -
Location: Florence, AZ	Measuring Point: Discharge
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): ~500 - 1200
Pump Setting (ft bbls): 10 ft	Pump Type: Airlifting
How Q Measured: Cone / Storviatech	Personnel: S. Hensel & B. Kienberg

Time	Discharge (gpm)	Pumping Water Level Depth (ft) <i>325</i>	Specific Capacity (gpm/ft)	Sand Content (ml/L)	pH	Sp. Cond. (mmhos/cm)	Temp. °F °C	Comments	NTU
1245	5.3	1033	-	0.3	8.27	1535	23.91	cloudy	374
1300	5.3	1033	-	0.1	8.27	1547	23.72	brown, cloudy	overrange
1345	5.3	1033	-	0.0	8.27	1564	23.84	cloudy	128
1400	5.6	1033	-	0.0	8.25	1548	23.94	(cloudy)	192
1420	5.6	1033	-	0.0	8.26	1546	23.96	brown, opaque	overrange
1430	5.6	1033	-	0.2	8.27	1546	23.90	cloudy	421
1455	5.6	1033	-	0.2	8.29	1535	24.05	brown, cloudy	overrange
1515	5.6	1033	-	0.5	8.27	1531	23.81	cloudy	524
1530	5.6	1033	-	1.6	8.24	1526	23.72	cloudy	215
1545	5.6	1033	-	0.2	8.27	1522	23.75	cloudy	161
1555	5.6	1033	-	0.1	8.28	1499	23.83	clear	59.4
1600	5.6	1033	-	0.1	8.28	1503	23.65	clear	29.0
1615	5.6	1033	-	0.0	8.27	1496	23.53	clear	18.7
1620	Stop Airlift	-	-	-	-	-	-	-	-
1650	Start Airlift	-	-	-	-	-	-	-	-
1655	4.2	1199	-	opaque	8.19	1358	22.33	brown, opaque	overrange
1710	4.2	1199	-	0.1	8.23	1459	22.72	brown, opaque	overrange
1730	5.1	1199	-	0.1	8.27	1479	22.70	cloudy	201
1745	5.1	1199	-	0.0	8.25	1473	22.87	cloudy	250
1800	5.1	1199	-	0.0	8.26	1460	22.84	clear	59.0
3/5/18	1810	5400 Airlifting	-	-	-	-	-	-	-
3/6/18	0715	Resume Airlift	-	-	-	-	-	-	-
	0720	10.0 1100 1070 10 10	1000	6.31	1431	21.04	Muddy	overrange	overrange
	0740	8 1100 1070 10 10	0.25	7.16	1460	22.23	(cloudy)	605	605
	0800	8 1100 1070 10 10	0.3	8.43	1499	23.15	(cloudy)	149	149
	0820	8 1100 1070 10 10	0.316	8.70	1470	22.70	(cloudy)	279	279
	0840	5400 1100 1070 10 10	0.4	9.16	1472	23.76	(cloudy)	overrange	overrange

Additional Comments:

**DEVELOPMENT
FIELD DATA LOG**

Project Name:	FCI PTF	Project No.:	124187-007
Well No.:	F-02	Date:	3/5/18
Location:	Fluvanna, VA	Measuring Point:	D-15 ft
Total Depth of Well (ft bbls):	1200	Screen Interval (ft bbls):	1152 - 1200
Pump Type/Setting (ft bbls):	VariouS	Activity:	A: ASW
How Q Measured:	Flow & Gravimetric	H&A Personnel:	R. Kientzberg

Time	Discharge (gpm)	Pumping Water-Level-Dp (ft bbls)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{hos/cm}$)	Temp. °C	Turbidity NTU	Comments
0900	5	1100 1070	BR	0.6	9.34	1436	23.48	DVR/low	Cloudy/Brown
0920	5	1100 1070	ML	0.7	9.28	1456	24.19	148	Cloudy
0940	6	1100 1070	SL-ML	0.8	9.34	1480	24.16	0.1	Muddy
1000	8	1100 1070	BR	0.9	9.62	1451	24.32	138	Cloudy
1020	8	1100 1070	BR	0.0	9.86	1494	23.83	120	Cloudy
1021		Stopper Air 151.1							
1040		Rush Air 151.1							
1045	6	1130 1100	BR	0.4	10.06	1464	24.28	105	Cloudy
1100	6	1130 1100	BR	Mud	9.96	1267	23.22	OVER	String 2-11 Muddy
1120	6	1130 1100	BR	Mud	9.64	1426	24.27	OVER	Brown + Cloudy
1140	6	1130 1100	BR	0.4	10.13	1496	25.75	338	Cloudy
1200	6	1130 1100	BR	0.4	9.96	1489	25.67	128	Cloudy
1220	6	1130 1100	BR	0.4	10.07	1464	25.71	OVER	Brown + Cloudy
1240	6	1130 1100	BR	0.4	10.28	1488	25.80	OVER	Light Brown + Cloudy
1250		Recoverd 51-12	pH	were conducting	9.6	In Light			
1250		white	4L	add another	jacket				
1340	6	1130		0.4	8.67	1609	25.89	483	Cloudy
1400	6	1130		0.4	8.22	1531	24.51	OVER	Brown + Cloudy
1420	6	1130		0.3	8.21	1507	24.25	OVER	Brown + Cloudy
1435		No flow. End in 112 and -L	Air 151.1						Very close. Stop Air 151.1
1440	8	1130		0.1	8.20	1507	24.05	OVER	Cloudy Brown
1500	8	1130		0.1	8.21	1510	24.35	952	Cloudy Brown
1520	8	1130		0.2	8.18	1508	24.43	OVER	Muddy
1540	8	1130		0.1	8.21	1503	24.28	OVER	Cloudy Brown
1600	8	1130		0.1	8.17	1503	24.12	744	Cloudy
1620	8	1130		0.1	8.22	1499	24.16	263	Cloudy
1625		Stop Air 151.1		add another	jacket				
Comments:									
1130 (Gordon informed that previously report depth was incorrect. Now @ 1130' 3.0's)									

HALEY ALDRICH

15.84

(38 1/2) 2 1/2 0.264

**DEVELOPMENT
FIELD DATA LOG**

Project Name:	FCI PTF	Project No.:	124687-007
Well No.:	F-02	Date:	3/6/18
Location:	Florance, AZ	Measuring Point:	Discharge
Total Depth of Well (ft bbls):	1200	Screen Interval (ft bbls):	~500 - 1200
Pump Type/Setting (ft bbls):	Vortex	Activity:	Air lift
How Q Measured:	Cone / Stopper method	H&A Personnel:	B. Krienerburg / C. Giusti / S. Kanay

Time	Discharge (gpm)	Pumping Water Level Depth (ft bbls)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{hos/cm}$)	Temp. °C	Turbidity NTU	Comments
1630	8	1150	0.1	8.11	1343	23.25	33.0		4:30 AM + Cloudy
1700	8	1150 (1/2)	0.0	8.13	1462	22.43	123		Cloudy + Change (to down)
1720	8	1120	MUD	8.17	1437	23.12	OVER		Muddy
1740	8	1130	0.0	8.23	1454	23.12	370		Cloudy
1800	—	1130	0.0	8.23	1448	22.14	98.4		Cloudy
1800	—	1160	Air lift						
1720		1150	AIR LIFT	From	1150	AT			
0730	8	1150	0.10	7.67	1461	15.76	OR		Brown / MUD
0805	8	1150	0.10	7.90	1290	22.19	23.0		MURKY / cloudy
0830	8	1150	0.1	8.05	1273	22.35	25		CLEAR
0915	8	1150	0.1	8.10	1314	22.03	313		MURKY / cloudy
0945	8	1153	300	8.10	1371	22.02	OR		MUD / SAND
1015	8	1153	20	8.23	1387	22.95	OR		MURKY / BROWN
1120	8	1160	900	8.17	1395	22.85	OR		MURKY / brown / SAND
1200	8	1160	0.5	8.15	1386	23.59	45.1		CLEAR / 0.5 ppm FILTER PACK
1245	8	1167	20.1	8.12	1380	23.50	57.5		CLEAR
1345	8	1169	30	8.15	1395	22.17	OR		Brown / MUD
1400	8	1169	20.1	8.17	1377	22.48	77.7		Clear → cloudy
1430	8	1171	400	8.15	1381	22.90	OR		Day / MUD
1453	8	1171	4	8.13	1396	23.28	91.7		brown
1530	8	1188	40	8.13	1377	22.98	OR		Brown / MUD
1605	8	1188	9	8.13	1376	22.95	38.4		CLOUDY
1635	8	1189	0.2	8.17	1387	22.70	30.6		CLEAR
1710	8	1189	0.2	8.18	1368	22.46	95.1		Cloudy
1755	8	1189	0.4	8.20	1373	22.91	18.6		MURKY
1800	—	1189	AIR LIFT						
715	8	1180		7.92	1237	18.95	50.2	murky	

Comments:

**DEVELOPMENT
FIELD DATA LOG**

Project Name: FCI PTF	Project No.: 129687-007
Well No.: F-02	Date: 3/8/18
Location: Florence, AZ	Measuring Point: discharge
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): ~870 - 1200
Pump Type/Setting (ft bbls): Various	Activity: Air lifting
How Q Measured: Core / St. Hatch	H&A Personnel: S. Parney

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{mhos/cm}$)	Temp. °C	Turbidity NTU	Comments
730	9	1180	-	0.3	8.22	1270	20.40	426	muddy
800	9	1180	-	2.0	8.30	1217	19.46	460	gravel pack
800	9	1180	-	1.0	8.24	1300	21.20	105	clear w/ gravel pack
815	9	1180	-	0.5	8.27	1271	16.89	35.2	clear w/ gravel pack
830	9	1181	-	80	8.21	1313	21.80	OR	muddy / brown
855	9	1192	-	0.1	8.05	1293	21.75	155	muddy
0915	9	1193	-	0.3	8.29	1320	22.50	93.1	muddy w/ gravel pack
0940	9	1192	-	40	8.38	1329	22.70	OR	muddy / brown
1000	9	1195	-	3.0	8.29	1319	22.72	89.1	clear, muddy w/ gravel pack
1025	9	1195	-	3.0	8.31	1338	23.36	64.0	"
1045	9	1200	-	30	8.33	1333	23.15	39.2	muddy w/ gravel / sand
1100	9	1200	-	15	8.29	1338	23.08	58.4	clear w/ gravel pack
1130	9	1200	-	0.5	8.37	1343	23.37	79.3	"
1200	9	1200	-	0.1	8.30	1346	23.71	16.6	clear
1320	Install	13 gallons of chlorine @ ~100'							
1326	Install	13 gallons of chlorine @ ~733'							
1358	Install	13 gallons of chlorine @ ~520'							
1500	Swabbing	900' - 1200'							
1520	Swabbing	900' - 900'							
1540	Swabbing	900' - 700'							
1555	Comp (btl)	swabbing, let chlorine sit overnight							
0715	490	Begin) air lifting							
0740	490	-	CO.1	8.03	1268	19.72	116	clear to cloudy white	1.04
0815	490	-	CO.1	8.06	1583	20.33	72.8	"	0.82
0855	490	-	CO.1	8.02	1904	21.15	51.1		
0920	490	-	CO.1	8.03	1878	21.43	40.4	clear to cloudy	
0925	-	Stop air lifting							

Comments:

**DEVELOPMENT
FIELD DATA LOG**

Project Name: FCI PTF	Project No.: 129487-007
Well No.: T-02	Date: 3/9/18
Location: Florence, AZ	Measuring Point: discharge
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): ~500 ft (200)
Pump Type/Setting (ft bbls): various	Activity: Airliftting
How Q Measured: none/stopwatch	H&A Personnel: J. Manay

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{mhos/cm}$)	Temp. °C	Turbidity NTU	Comments
1020		Begin airlift		0 @ 675					Free Cl 1 Total chl 1
1025	10	675		0.0 7.87	3217	21.52	0R	yellow/brown (muf) 4.40	4.40
1055	10	675		0.1 7.90	2274	22.24	21.8	light yellow/cloudy	4.40
1135	10	675		0.1 7.83	2069	22.59	19.5	white cloudy	
1215	10	675		0.1 8.02	2016	22.67	66.8	white cloudy	
1255	10	675		1.0 7.94	1977	22.85	70.9		
1340	10	675		15 7.94	1952	23.18	0R	orange brown, cloudy, muf	
1425	10	675		11 7.87	1909	22.87	0R	" "	
1540	10	675		14 8.07	1913	23.12	0R	" "	
1620	10	675		7 7.75	1868	22.65	0R	" "	
1705	10	675		0.4 8.11	1849	22.44	80.2	light yellow/white cloudy	
1745	10	675		0.24 6.10	1795	22.44	77.530	" "	
1755		begin airlift off							Total chl 1
1810		675		Begin Airlift					
1840	10	675		20.1 7.60	1741	20.91	68.4	clear, slightly cloudy	
1870	10	675		20.1 8.06	1653	21.61	96.0	" "	0.00
1880		airlift off							
1845		810		steril airlift					0.0 mg/L
0850		810		0.0 7.81	2498	21.68	56.2	light orange, cloudy	
0920		810		0.3 8.00	1767	22.32	247	light brown, cloudy	
0955		810		0.0 8.15	1729	22.55	11.8	white, cloudy	
1028		810		0.0 8.09	1691	22.62	79.6	" "	
1105		810		0.0 8.17	1671	22.60	59.0	clear to white cloudy	
1110		810		begin airlift					
1200	1004	begin airlift							
1203	1004	V	20.1 9.03	1629	21.98	130	light yellow, cloudy		
1215	1004	V	20.2 8.03	2867	22.58	0R	brown, cloudy		
1244	1004	V	0.0 8.10	1644	22.40	0R	" "		0.4

Comments: flashing
Per Hatch, 4.40 average

DEVELOPMENT
FIELD DATA LOG

Project Name: FCC PTP	Project No.: 129687-067
Well No.: I-02	Date: 3/10/18
Location: Florence, AZ	Measuring Point: discharge
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): -500 to 1200
Pump Type/Setting (ft bbls): various	Activity: air lifting
How Q Measured: cone/stopwatch	H&A Personnel: S. Kaney

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (μhos/cm)	Temp. °C	Turbidity NTU	Comments
1330		1004	-	>1.2*	8.15	15.93	22.70	974	light brown, cloudy, sediment
1400		1004	-	>4*	8.15	1588	22.63	906	"
1445		1004	-	>2*	8.19	1563	22.55	873	"
1520		1004	-	>1.5*	8.19	1540	22.41	887	"
1600		1004	-	20.3	8.16	1539	22.30	884	"
1625		1004	-	>1.0*	8.19	1520	21.70	898	"
1655		1004	-	>1.5*	8.16	1515	22.01	776	light orange, cloudy, mud
1735		1004	-	21.5	8.16	1495	22.03	759	"
1800		Stop air lift							
0705	—	Start air lift @ 1004'							
0730		1004	-	0.1	7.81	18.96	21.04	109	clear, light yellow, fine sand
0800		1004	-	0.3	8.04	1539	21.50	124	"
0835		1004	-	0.1	8.06	1528	21.83	42.1	" no sand
0850	—	Stop pumping w/ air lifting							
0920	—	Start air lifting							
0930	—	Stop air lifting							
0935	—	1168	Start air lifting					0.02	
0955	5	1168	-	mus	7.90	5673	22.24	1277	muddy, brown, mud
1005	5	1168	-	100	8.18	2674	22.08	0.2	brown, cloudy, fresh
1028	5	1168	-	0.3	8.14	1537	22.88	649	light brown, cloudy, mud
1115	5	1168	-	0.1	8.17	1486	23.74	100	"
1150	8	1168	-	0.1	8.16	1507	23.96	59.8	"
1225	5	1168	-	0.3	8.17	1523	23.84	536	"
1250	5	1168	-	0.1	8.17	1486	23.27	339	"
1315	5	1171	-	0.1	8.17	1529	23.96	295	"
1340	5	1176	-	0.3	8.17	1599	24.58	525	"
1445	5	1187	-	0.1	8.19	1479	23.64	523	"
1530	5	1197	-	17	8.16	1466	23.11	0.02	brown, muddy, gravel

Comments:

* hadn't finished setting before took next reading

HALEY
ALDRICH

**DEVELOPMENT
FIELD DATA LOG**

Project Name: FCI PTF	Project No.: 129687-007
Well No.: I-02	Date: 3/14/18
Location: Florida, AZ	Measuring Point: Sample Port
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): 500 - 1200
Pump Type/Setting (ft bbls): 1163	Activity: Pumping
How Q Measured: BMP + Submersible	H&A Personnel: R. K. Berg

Time	Discharge (gpm)	Pumping Water Level (ft) BMP	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{mhos/cm}$)	Temp. °C	Turbidity NTU	Comments
0848		228.34	(5 ft all)	<0.1	7.81	2212	23.91	878	
0850		534.41	Pump	<0.1					
0855	60	262.7	518200	<0.1	7.81	2050	24.04	97.4	Cloudy, No Wind
0915	60	—	519900	<0.1	7.77	1979	24.07	64.1	Cloudy
0935	60	268.8	520900	<0.1	7.87	1924	24.15	34.4	Cloudy
0955	60	269.8	522100	<0.1	7.84	1924	24.15	34.4	Cloudy
1015	60	270.5	522400	0.0	7.86	1905	24.49	20.2	Cloudy
1035	60	271.1	524600	0.0	7.81	1883	24.31	21.1	SAA
1055	60	271.6	525800	0.0	7.79	1864	24.57	15.1	SAA
1115	60	271.8	527000	0.0	7.81	1884	24.47	13.2	SAA
1135	60	—	528200	—	7.81	1884	24.47	13.2	Notes: R1, 2-3m
1200	60	271.6	529700	0.0	7.85	1843	24.30	11.6	Slight Cloudy
1215	60	271.7	530600	0.0	7.80	1849	24.40	10.3	On
1230	60	271.8	531500	0.0	7.86	1853	24.32	9.38	Cloudy
1245	60	271.8	532400	0.0	7.82	1839	24.56	8.19	Cloudy
1248	—	53693.1	Pump	—					
1338	—	535.78	530600	—	5.81	—	—	5.81	
1340	—	535.78	530600	—	5.81	—	—	5.81	
1345	75	267.5	533900	0.0	7.91	1862	24.60	41.0	Cloudy
1400	75	269.0	533800	0.0	7.87	1835	24.44	21.9	Cloudy
1415	75	269.9	5334800	0.0	7.90	1830	24.52	16.6	Cloudy
1430	75	270.3	533700	0.0	7.87	1837	24.56	11.9	Slight Cloudy
1445	75	270.7	536600	0.0	7.87	1838	24.89	13.7	?) SAA
1500	75	270.9	537500	0.0	7.86	1816	24.29	13.2	SAA
1515	75	270.9	538400	0.0	7.90	1842	24.64	41.0	SAA
1530	75	271.0	539300	0.0	7.82	1828	24.72	11.6	SAA
1545	75	271.6	540200	0.0	7.80	1809	24.31	10.8	SAA
1600	75	271.8	541100	0.0	7.76	1817	24.73	9.09	SAA Clear

Comments: BMP = Sampling tube w/ 1.65' stickup.

**DEVELOPMENT
FIELD DATA LOG**

Project Name: <u>FLI PTF</u>	Project No.: <u>129687</u>
Well No.: <u>I-02</u>	Date: <u>3/14/18</u>
Location: <u>Flagstaff, AZ</u>	Measuring Point: <u>Sample Port</u>
Total Depth of Well (ft bbls): <u>1200</u>	Screen Interval (ft bbls): <u>500 - 1200</u>
Pump Type/Setting (ft bbls): <u>11t3</u>	Activity: <u>Pumping</u>
How Q Measured: <u>Bucket + stopwatch</u>	H&A Personnel: <u>R. Kinner, S. Long</u>

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{mhos/cm}$)	Temp. °C	Turbidity NTU	Comments
1600	—	Stop pump	—	—	—	—	—	—	—
1615	—	268.2	541200	0.0	7.84	1802	23.88	18.20	Slight cloudy
1617	75	265.8	541300	0.0	7.84	1819	24.50	19.1	SAA
1630	75	270.4	542100	0.0	7.88	1819	24.47	12.9	SAA
1645	75	270.9	543100	0.0	7.85	1816	24.05	10.4	SAA
1700	75	271.2	543900	0.0	7.84	1798	24.27	12.9	SAA
1715	75	271.5	544800	0.0	7.83	1808	24.04	10.9	SAA
1730	75	271.6	545700	0.0	7.89	1802	24.04	10.9	SAA
1745	75	271.8	546700	0.0	7.86	1801	23.84	10.3	SAA
1800	75	271.9	547600	0.0	7.87	1780	23.74	12.3	SAA
1800	—	Stop pump	—	—	—	—	—	—	—
0705	—	258.14	549700	—	—	—	—	—	Slight
0708	75	260.80	547700	0.0	7.33	1843	22.42	41.9	Start pump; cloudy
0730	75	264.6	549000	0.0	7.74	1788	21.88	17.3	(Cloudy)
0745	75	265.6	549900	0.0	7.76	1793	22.09	11.7	SAA
0800	75	266.5	550800	0.0	7.90	1782	22.07	10.0	SAA
0815	75	267.6	551700	0.0	7.86	1786	22.69	8.66	(Cloudy)
0820	75	Stop pump	—	—	—	—	—	—	—
0835	—	552100	—	—	—	—	—	—	Slight Pumping
0838	70	264.5	552300	0.0	7.87	1718	21.85	11.1	(Cloudy)
0900	70	267.3	553600	0.0	7.84	1781	22.35	25.2	SAA
0915	70	267.85	554600	0.0	7.68	1779	23.10	14.9	SAA
0930	70	268.45	555500	0.0	7.64	1770	23.42	13.9	SAA
0945	70	268.72	556300	0.0	7.49	1822	23.37	12.7	Clear
1000	70	269.02	557200	0.0	7.69	1806	23.19	11.0	Clear
1015	70	269.4	558200	0.0	7.64	1776	23.11	12.8	(Cloudy)
1030	70	269.7	559000	0.0	7.70	1777	22.78	7.93	(Cloudy)
1032	—	Stop pumping	—	—	—	—	—	—	—

Comments:

**DEVELOPMENT
FIELD DATA LOG**

Project Name: FCI PTF	Project No.: 129687
Well No.: I-02	Date: 3/15/18
Location: Florence, AF	Measuring Point: Sample Port
Total Depth of Well (ft bbls): 1220	Screen Interval (ft bbls): 500 - 1200
Pump Type/Setting (ft bbls): 1163	Activity: Pumping
How Q Measured: Flowmeter	H&A Personnel: D. Kneiberg

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{mhos/cm}$)	Temp. °C	Turbidity NTU	Comments
1046	—	235.55	559200	—	7.81	1800	23.44	44.4	
1047	—	263.83	559400	—	7.81	1800	23.44	44.4	
1050	60	269.9	559400	0.0	7.81	1800	23.44	44.4	(Cloudy)
1113	60	269.8	560900	0.0	7.81	1797	23.64	19.7	(Cloudy)
1130	60	270.4	561800	0.0	7.84	1792	23.31	12.0	SAA
1145	60	270.8	562700	0.0	7.52	1806	23.72	8.91	(Cloudy)
1148	—	562900	—	5-0 P	—	—	—	—	
1203	—	562900	—	5-0 P	—	—	—	—	
1208	60	267.5	563000	0.0	7.80	1820	23.78	43.7	(Cloudy)
1215	60	269.1	563400	0.0	7.41	1783	23.14	57.7	SAA
1230	60	270.1	564300	0.0	7.48	1790	23.47	17.5	SAA (Cloudy)
1245	60	270.7	565200	0.0	7.41	1806	23.49	11.7	SAA
1300	60	271.0	566100	0.0	7.45	1787	23.28	12.6	SAA
1315	60	271.4	567000	0.0	7.44	1791	23.47	11.7	SAA
1330	60	271.7	567900	0.0	7.47	1786	23.46	8.45	SAA
1333	—	PL 0.55	568100	—	—	—	—	—	
1356	—	276.58	568100	—	—	—	—	—	
1357	—	PL 0 on	—	—	—	—	—	—	
1400	60	268.6	568300	0.0	7.56	1776	23.49	42.4	(Cloudy)
1415	60	270.1	569200	0.0	7.51	1818	23.55	14.0	SAA
1430	60	270.3	570100	0.0	7.55	1808	23.93	12.2	SAA
1445	60	270.6	571000	0.0	7.58	1798	23.21	11.2	SAA
1500	60	270.6	571900	0.0	7.57	1812	24.01	20.0	SAA
1515	60	270.7	572800	0.0	7.58	1799	23.82	7.47	(Cloudy)
1517	PL	—	0.55	—	—	—	—	—	
1530	PL	PL 0.5	572900	—	—	—	—	—	
1532	60	266.4	573000	0.0	7.62	1793	23.20	12.1	SAA (Cloudy)
1545	60	269.5	573800	0.0	7.62	1808	23.63	11.2	SAA
1600	60	270.2	574700	0.0	7.58	1814	23.85	9.71	(Cloudy)
1606	PL	PL 0.55	575100	—	—	—	—	—	
Comments:									

**DEVELOPMENT
FIELD DATA LOG**

Project Name: FCI PTF	Project No.: 129687-007
Well No.: I-02	Date: 11/15/18
Location: Florida, AZ	Measuring Point: Sample Point
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): 500 - 1200
Pump Type/Setting (ft bbls): 1163	Activity: Pumping
How Q Measured: Flowmeter	H&A Personnel: B. Kienzberg

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (μmhos/cm)	Temp. °C	Turbidity NTU	Comments
1620		236.12	579000	Pump On					
1622	60	265.3	575100	0.0	7.60	1782	23.05	13.0	Mostly Clear
1630	60	268.1	575600	0.0	7.61	1787	23.69	21.4	(Cloudy)
1645	1700	60	269.3	576500	0.0	7.60	1846	23.56	13.0
1700	60	269.9	577400	0.0	7.61	1793	23.35	8.26	Clear
1701	Pump Off								
1715		235.84	577500						Static
1716		Pump On							
1717	60	265.4	577500	0.0	7.66	1786	22.86	11.5	Mostly Clear
1730	60	268.8	578400	0.0	7.77	1791	23.43	15.8	SAA
1745	60	269.5	579200	0.0	7.58	1791	23.34	7.34	Clear
1800	60	270.0	580100	0.0	7.63	1782	23.42	8.40	Clear
0645		228.14	580100						Static before pumping
0700		Pump On							
0702	60	259.7	580300	0.0	7.02	1991	21.61	84.4	Cloudy
0715	60	263.0	581100	0.0	7.91	1970	21.52	14.7	Cloudy (Cloudy)
0730	60	264.5	582000	0.0	7.84	1959	21.63	7.09	Cloudy
0735	Pump Off								
0749		231.04	582200						
0750		231.04	Pump Off						
0751	60	265.8	582300	0.0	7.93	1951	21.53	9.16	Cloudy
0806	60	264.6	583200	0.0	7.83	1972	22.16	9.05	Cloudy
0821	60	265.6	584100	0.0	7.77	1952	22.46	8.22	Cloudy
0822	Pump Off								
0836		232.28	5841200						
0837	Pump On								
0838	60	261.0	584300	0.0	7.83	1967	22.33	8.40	Cloudy
0853	60	265.5	585100	0.0	7.76	1970	22.58	8.26	Cloudy

Comments:

**DEVELOPMENT
FIELD DATA LOG**

Project Name: FCI PTF	Project No.: 129687-007
Well No.: F-02	Date: 3/16/18
Location: Florida, AZ	Measuring Point: Sample Post
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): 500-1200
Pump Type/Setting (ft bbls): 1163;	Activity: Pumping
How Q Measured: Flowmeter	H&A Personnel: B. Kithenberger

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{mhos/cm}$)	Temp. °C	Turbidity NTU	Comments
0908	60	22266.5	586000	0.0	7.72	1980	22.89	6.82	Clear
0909	—	Pump off	0.55	—	—	—	—	—	—
0923	—	232.98	586100	—	—	—	—	—	Starts between Pump ps
0924	—	Pump on	—	—	—	—	—	—	—
0925	60	259.30	586100	0.0	7.76	1956	23.00	7.28	Clear
0940	60	266.1	587100	0.0	7.79	1985	23.31	9.92	Clear
0955	60	267.0	587900	0.0	7.74	1990	23.46	9.90	Clear
1000	Pump off → Pumping Pump up to 900.0 ft bgs	—	—	—	—	—	—	—	—
1102	—	231.64	588300	—	—	—	—	—	—
1102	54.1 ft Pump off	—	—	—	—	—	—	—	—
1113	65	260.2	589100	0.0	7.76	2041	23.72	47.6	Cloudy
1130	65	261.7	590000	0.0	7.68	2010	23.71	22.2	Cloudy
1145	65	262.8	591000	0.0	7.67	2017	24.09	16.5	SAA
1200	65	264.3	591900	0.0	7.63	2021	23.86	11.2	Almond Clear
1215	65	264.0	592800	0.0	7.76	2020	23.83	10.7	SAA
1230	65	264.6	593700	0.0	7.59	2014	23.97	9.20	Clear
1244	—	233.10	593800	—	—	—	—	—	—
1245	—	54.1 ft Pump off	—	—	—	—	—	—	—
1246	65	259.81	593900	0.0	7.70	1993	23.30	12.3	Mostly Clear
1300	65	264.2	594800	0.0	7.65	2036	24.13	9.56	Clear
1315	—	265.2	595700	0.0	7.66	2007	24.16	7.91	SAA
1317	Pump off	—	—	—	—	—	—	—	—
1332	—	235.73	595800	—	—	—	—	—	—
1333	Pump on	—	—	—	—	—	—	—	—
1333	65	260.3	595900	0.0	7.56	2006	23.56	12.3	Mostly Clear
1348	65	264.9	596800	0.0	7.61	2081	24.22	12.3	SAA
1403	65	265.7	597700	0.0	7.61	2010	24.05	9.93	Clear
1404	Pump off	0.55	—	—	—	—	—	—	—

Comments:

* 54.1 ft pump

(1)

**DEVELOPMENT
FIELD DATA LOG**

Project Name: FCF PTF	Project No.: 129687
Well No.: I-02	Date: 3/16/18
Location: Floresville, TX	Measuring Point: Sample Port
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): 500 - 1200
Pump Type/Setting (ft bbls): 900.9; 599.5	Activity: Pumping
How Q Measured: Flowmeter	H&A Personnel: R. Kiemerly

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. (μmhos/cm)	Temp. °C	Turbidity NTU	Comments
1418	—	236.04	597800	—	—	—	—	—	—
1419	—	Pump On	—	—	—	—	—	—	—
1420	65	262.8	597900	0.0	7.70	2072	23.72	41.1	Mostly Clear
1436	65	265.1	598700	0.0	7.76	2014	23.90	9.02	(1 hr)
1451	65	266.0	599700	0.0	7.82	2028	24.10	7.19	(1 hr)
1452	—	Pump OFF	—	—	—	—	—	—	—
1602	—	235.49	599900	—	—	—	—	—	—
1603	—	Pump On	—	—	—	—	—	—	—
1615	65	268.7	600600	0.0	7.79	2054	23.01	47.8	Cloudy
1630	65	262.2	601700	0.0	7.71	1999	23.45	17.0	SAA
1645	65	263.1	602700	0.0	7.70	1997	23.41	12.1	Mostly Clear
1700	65	263.7	603400	0.0	7.70	2003	23.54	10.3	SAA
1715	65	264.3	604600	0.0	7.67	1990	23.44	9.69	(1 hr)
1717	—	Pump OFF	—	—	—	—	—	—	—
1731	—	238.13	604700	—	—	—	—	—	—
1732	—	Pump On	—	—	—	—	—	—	—
1733	65	259.1	604800	0.0	7.69	1977	23.04	64.3	(1 hr)
1748	65	264.0	605800	0.0	7.68	1993	22.99	17.2	SAA
1803	65	264.96	607000	0.0	7.69	1978	23.47	10.9	Clear
1828	65	265.7	608400	0.0	7.59	1960	23.25	6.74	Clear
1843	65	266.05	609400	0.0	7.60	1967	16.44	8.46	Clear 22.87°C
1846	—	PUMP OFF	—	—	—	—	—	—	—
1901	—	237.28	609600	—	—	—	—	—	—
1902	65	267.35	609700	0.0	7.67	1937	22.05	71.6	Cloudy
1917	65	265.30	610600	0.0	7.72	1958	22.51	8.07	Clear
1932	65	266.05	611600	0.0	7.68	1967	20.04	5.92	Clear 22.73°C
1947	65	266.6	612600	0.0	7.68	1959	23.73	5.59	Clear
1949	—	PUMP OFF	—	—	—	—	—	—	—
Comments:									
* 1.55' stickup 5/ 900.9' depth									
1.45' " " 5/ 599.5' "									

**DEVELOPMENT
FIELD DATA LOG**

Project Name: FCC PTF	Project No.: 1291687
Well No.: I-02	Date: 3-16-18
Location: FLORENCE, AZ	Measuring Point: Sample Point A
Total Depth of Well (ft bbls): 1200	Screen Interval (ft bbls): 500 - 1200
Pump Type/Setting (ft bbls):	Activity: PUMPING
How Q Measured: Flow Meter	H&A Personnel: VFORDS

Time	Discharge (gpm)	Pumping Water Level (ft)	Specific Capacity (gpm/ft)	Sand Content (ppm)	pH	Sp. Cond. ($\mu\text{mhos/cm}$)	Temp. °C	Turbidity NTU	Comments
2005	—	237.35	612700	—	—	—	—	—	—
2006	— PUMP ON —	—	—	—	—	—	—	—	—
2007	65	267.6	—	0.0	7.72	1941	23.38	12.0	Clear
2023	65	265.75	613900	0.0	7.68	1962	22.42	5.41	clear
2038	65	266.60	614900	0.0	7.69	1963	23.10	5.30	clear
2041	— PUMP OFF —	—	—	—	—	—	—	—	—
2056	—	237.10	615100	—	—	—	—	—	—
2058	65	267.10	615200	0.0	7.64	1964	22.72	12.9	clear
2113	65	265.90	616100	0.0	7.71	1946	23.03	7.23	clear
2128	65	266.75	617200	0.0	7.72	1936	23.17	3.66	clear
2131	PUMP OFF	—	—	—	—	—	—	—	—
2145	—	237.40	617300	—	—	—	—	—	—
2148	PUMP ON	—	—	—	—	—	—	—	—
2149	65	263.15	617400	0.0	7.55	1936	22.73	5.90	clear
2204	65	266.10	618400	0.0	7.74	1946	21.86	5.40	clear
2219	65	266.85	619400	0.0	7.69	1940	22.77	4.23	clear
2221	PUMP OFF	—	—	—	—	—	—	—	—
2236	—	237.60	619600	—	—	—	—	—	—
2238	PUMP ON	—	—	—	—	—	—	—	—
2239	65	267.00	619700	0.0	7.62	1917	22.63	9.72	clear
2254	65	266.30	620700	0.0	7.76	1934	22.55	4.36	clear
2309	65	267.05	621700	0.0	7.72	1962	22.52	2.11	clear
24000	65	268.35	625300	0.0	7.67	1957	22.69	5.30	clear
0105	65	269.00	629300	0.0	7.70	1958	22.21	3.34	clear
0205	65	269.45	633300	0.0	7.67	1934	21.98	3.31	clear
0305	65	269.75	637200	0.0	7.70	1946	22.54	3.63	clear
0405	65	270.00	641200	0.0	7.69	1942	22.25	0.89	clear
0505	65	270.30	645100	0.0	7.71	1951	22.08	1.65	clear
0605	65	270.5	648300	0.0	7.66	1916	21.81	1.84	clear
0705	65	270.6	652900	0.0	7.75	1930	21.69	0.59	Clear

APPENDIX I

Well Video Log and Gyroscopic Survey Reports

Client: Florence Copper Survey Date: March 21, 2018
 Address: 1575 West Hunt Hwy Invoice: _____ Run: 1
 City: Florence State: AZ Zip: 85132 Well Name: I-02
 Requested By: H&A P.O.: _____ Well Owner: Florence Copper
 Copy To: _____ Camera: CCV S.S. Color Camera - Ring of Lights
 Purpose: General Inspection Zero Datum: Top of Casing
 Location: _____ Depth: 1200 ft. Vehicle: 290
 Field: Florence Copper Project Type Perfs: Horizontal Slots
 1st Csg.O.D. 5 In. Csg Weight: _____ From: 0 ft. To: 1126 ft. 2nd Csg.O.D. _____ Csg Weight: _____ From: _____ To: _____
 Standing Water Level: 232.04 ft. Pumping Water Level: _____ Pump Depth: _____ O.D.Ref.: Measured Casing Buildup: None
 Operator: D. Beam Lat.: _____ Long.: _____ Sec: _____ Twp: _____ Rge: _____

Other Information:		True Depths: (SideScan-Feet)	WELLBORE / CASING INFORMATION
0 Ft (See Other Side)	232 Ft (See Other Side)	0.	Survey started at the top of the casing.
		232.	Static water level observed.
		427.	Side of casing above the transition.
		522.1	Transition piece observed.
427 Ft (See Other Side)	522.1 Ft (See Other Side)	530.	Down view of perforations.
		643.1	Transition piece observed.
		846.1	Down view of the perforations.
530 Ft (See Other Side)	643.1 Ft (See Other Side)	884.	View of a seam inside the casing.
		1,002.	Another down view of the perforation.s
		1,084.1	Side view of the perforation.s
		1,126.	Soft bottom, survey ended.
846.1 Ft (See Other Side)	884 Ft (See Other Side)		
			
1002 Ft (See Other Side)	1084.1 Ft (See Other Side)		
			
1126 Ft (See Other Side)			
			

Notes:

Page Number: 1

11 WELLBORE SHAPSHOTS

0 Ft (Enlargement)



232 Ft (Enlargement)



427 Ft (Enlargement)



522.1 Ft (Enlargement)



530 Ft (Enlargement)



643.1 Ft (Enlargement)



846.1 Ft (Enlargement)



884 Ft (Enlargement)



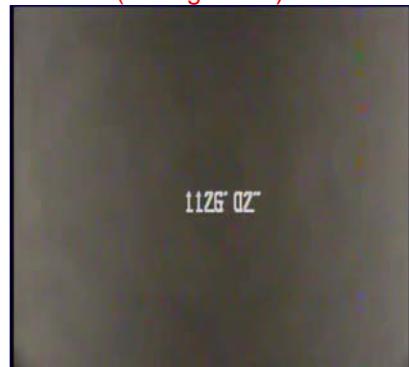
1002 Ft (Enlargement)



1084.1 Ft (Enlargement)



1126 Ft (Enlargement)



Drift Report

Wellbore DRIFT Interpretation

PREPARED ESPECIALLY FOR
Florence Copper and Florence Copper
I-02

Wednesday - March 21, 2018



This Wellbore Interpretation Package represents our best efforts to provide a correct interpretation. Nevertheless, since all interpretations are opinions based on inferences from electrical or other types of measurements, we cannot and do not guarantee the accuracy or correctness of any interpretation, and we shall not be liable or responsible for any loss, costs, damages, or expenses incurred or sustained by Customer resulting from any interpretation made by this document. We do not warrant or guarantee the accuracy of the data, specifically including (but without limitations) the accuracy of data transmitted by electronic process, and we will not be responsible for accidental or intentional interception of such data by third parties. Our employees are not empowered to change or otherwise modify the attached interpretation. Furthermore, along with Eagle Pro Software we do not warrant or guarantee the accuracy of the programming techniques employed to produce this document. By accepting this Interpretation Package, the Customer agrees to the foregoing, and to our General Terms and Conditions.

Southwest Exploration Services, LLC
(480) 926-4558

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

Company:	Florence Copper		Well Owner:	Florence Copper	
County:	Pinal	State:	Arizona	Country:	United States
Well Number:	I-02	Survey Date:	Wednesday - March 21, 2018	Magnetic Declination:	Declination Correction Not Used
Field:	Florence Copper Project		Drift Calculation Methodology:		Balanced Tangential Method
Location:					
Remarks:					
Witness:	H&A	Vehicle No.:	800	Invoice No.:	Operator: K. MITCHELL
Tool:	Gyro - 1422		Lat.:	Long.:	Sec.: Twp.: Rge.:

MEASURED DATA			DATA COMPUTATIONS						
DEPTHs, feet	INCLINATIONS, degrees	AZIMUTHs, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEg SEV., degrees per 20 Feet	DOGLEg SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BGR., degrees
0	0.78	263.84	0.00						
20	0.18	274.13	19.99	-0.012	-0.167	1.00	0.42	0.17' (2.04")	265.80
40	0.26	286.64	39.98	0.003	-0.242	0.41	0.51	0.24' (2.88")	270.80
60	0.35	348.15	59.97	0.076	-0.298	0.96	2.38	0.31' (3.72")	284.30
80	0.12	224.37	79.96	0.121	-0.325	0.84	4.10	0.35' (4.20")	290.40
100	0.14	186.45	99.96	0.082	-0.342	0.42	1.51	0.35' (4.20")	283.40
120	0.19	150.51	119.95	0.029	-0.328	0.13	1.43	0.33' (3.96")	275.00
140	0.34	109.50	139.94	-0.020	-0.256	0.43	1.63	0.26' (3.12")	265.60
160	0.35	089.83	159.93	-0.040	-0.139	0.83	0.79	0.14' (1.68")	254.10
180	0.45	089.83	179.92	-0.040	0.001	0.95	0.00	0.04' (.48")	179.10
200	0.34	080.57	199.91	-0.030	0.138	0.37	0.38	0.14' (1.68")	102.30
220	0.33	079.52	219.90	-0.010	0.253	1.00	0.04	0.25' (3.00")	092.20
240	0.26	070.86	239.89	0.015	0.353	1.00	0.35	0.35' (4.20")	087.50
260	0.37	075.61	259.88	0.046	0.458	0.34	0.19	0.46' (5.52")	084.30
280	0.42	084.21	279.87	0.069	0.593	0.93	0.35	0.60' (7.20")	083.30
300	0.35	096.40	299.86	0.070	0.727	0.78	0.49	0.73' (8.76")	084.50
320	0.35	107.06	319.85	0.045	0.846	0.53	0.43	0.85' (10.20")	086.90
340	0.25	136.84	339.84	-0.005	0.934	0.00	1.19	0.93' (11.16")	090.30

Page No. 1 True Vertical Depth: **1169.43'** Final Drift Distance: **1.85'** (22.20") Final Drift Bearing: **146.30°**

Note: Magnetic Declination is not used because it is not a factor in the calculation of well drift or alignment. Magnetic Declination is only important if attempting to hit a target or miss another well and then it is included in the calculations.

WELLBORE DRIFT INTERPRETATION

Southwest Exploration Services, LLC

(480) 926-4558

I-02

MEASURED DATA			DATA COMPUTATIONS						
DEPTHs, feet	INCLINATIONS, degrees	AZIMUTHs, degrees	TVD, feet	T. LATITUDE, feet	T. LONGITUDE, feet	DOGLEG SEV., degrees per 20 Feet	DOGLEG SEV., degrees per 100 feet	DRIFT DIST., feet	DRIFT BRG., degrees
360	0.21°	165.65°	359.83	-0.072	0.973	0.56	1.16	0.98' (11.76")	094.30
380	0.17°	177.92°	379.82	-0.137	0.983	0.73	0.50	0.99' (11.88")	097.90
400	0.15°	229.66°	399.81	-0.184	0.964	0.88	2.03	0.98' (11.76")	100.80
420	0.11°	272.56°	419.80	-0.200	0.925	0.20	1.70	0.95' (11.40")	102.20
440	0.26°	301.33°	439.79	-0.176	0.867	0.97	1.16	0.88' (10.56")	101.40
460	0.13°	306.39°	459.78	-0.139	0.810	0.96	0.21	0.82' (9.84")	099.70
480	0.25°	043.28°	479.77	-0.094	0.822	0.12	3.48	0.83' (9.96")	096.50
500	0.31°	350.47°	499.76	-0.009	0.843	0.81	2.07	0.84' (10.08")	090.60
520	0.32°	074.41°	519.75	0.059	0.888	0.59	3.11	0.89' (10.68")	086.20
540	0.32°	046.44°	539.74	0.112	0.982	0.73	1.12	0.99' (11.88")	083.50
560	0.28°	100.86°	559.73	0.141	1.070	0.28	2.13	1.08' (12.96")	082.50
580	0.42°	031.68°	579.72	0.194	1.156	0.77	2.64	1.17' (14.04")	080.50
600	0.29°	111.54°	599.71	0.238	1.242	0.49	2.98	1.26' (15.12")	079.20
620	0.26°	221.88°	619.70	0.186	1.259	0.69	3.82	1.27' (15.24")	081.60
640	0.34°	285.76°	639.69	0.168	1.172	0.13	2.46	1.18' (14.16")	081.80
660	0.31°	120.71°	659.68	0.156	1.161	0.83	4.61	1.17' (14.04")	082.30
680	0.58°	141.83°	679.67	0.049	1.270	0.80	0.85	1.27' (15.24")	087.80
700	0.27°	163.33°	699.66	-0.076	1.346	0.25	0.87	1.35' (16.20")	093.20
720	0.17°	115.93°	719.65	-0.134	1.386	0.54	1.87	1.39' (16.68")	095.50
740	0.19°	322.77°	739.64	-0.121	1.393	0.24	4.52	1.40' (16.80")	094.90
760	0.25°	090.03°	759.63	-0.095	1.417	0.94	4.17	1.42' (17.04")	093.80
780	0.14°	053.62°	779.62	-0.081	1.480	0.65	1.45	1.48' (17.76")	093.10
800	0.19°	200.47°	799.61	-0.098	1.488	0.97	4.46	1.49' (17.88")	093.80
820	0.17°	276.90°	819.60	-0.126	1.447	0.06	2.88	1.45' (17.40")	095.00
840	0.19°	349.33°	839.59	-0.090	1.411	0.29	2.75	1.41' (16.92")	093.60
860	0.13°	337.32°	859.58	-0.036	1.396	0.57	0.49	1.40' (16.80")	091.50
880	0.25°	051.85°	879.57	0.012	1.422	0.47	2.82	1.42' (17.04")	089.50
900	0.28°	143.80°	899.56	0.000	1.485	0.42	3.34	1.49' (17.88")	090.00
920	0.54°	215.36°	919.55	-0.116	1.459	0.69	2.72	1.46' (17.52")	094.60
940	0.54°	185.23°	939.54	-0.287	1.396	0.04	1.21	1.43' (17.16")	101.60
960	0.43°	188.47°	959.53	-0.455	1.376	0.30	0.13	1.45' (17.40")	108.30
980	0.69°	210.75°	979.52	-0.633	1.303	0.98	0.90	1.45' (17.40")	115.90
1,000	0.54°	184.10°	999.52	-0.830	1.235	0.95	1.07	1.49' (17.88")	123.90

PLANE OF DRIFT VIEW - I-02

Florence Copper

Florence Copper

Drift Distance = 1.85 Feet

Drift Bearing = 146.3 Degrees

True Vertical Depth = 1169.43 Feet



Date of Survey: Wednesday - March 21, 2018

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

3D PROJECTION VIEW - I-02

Florence Copper

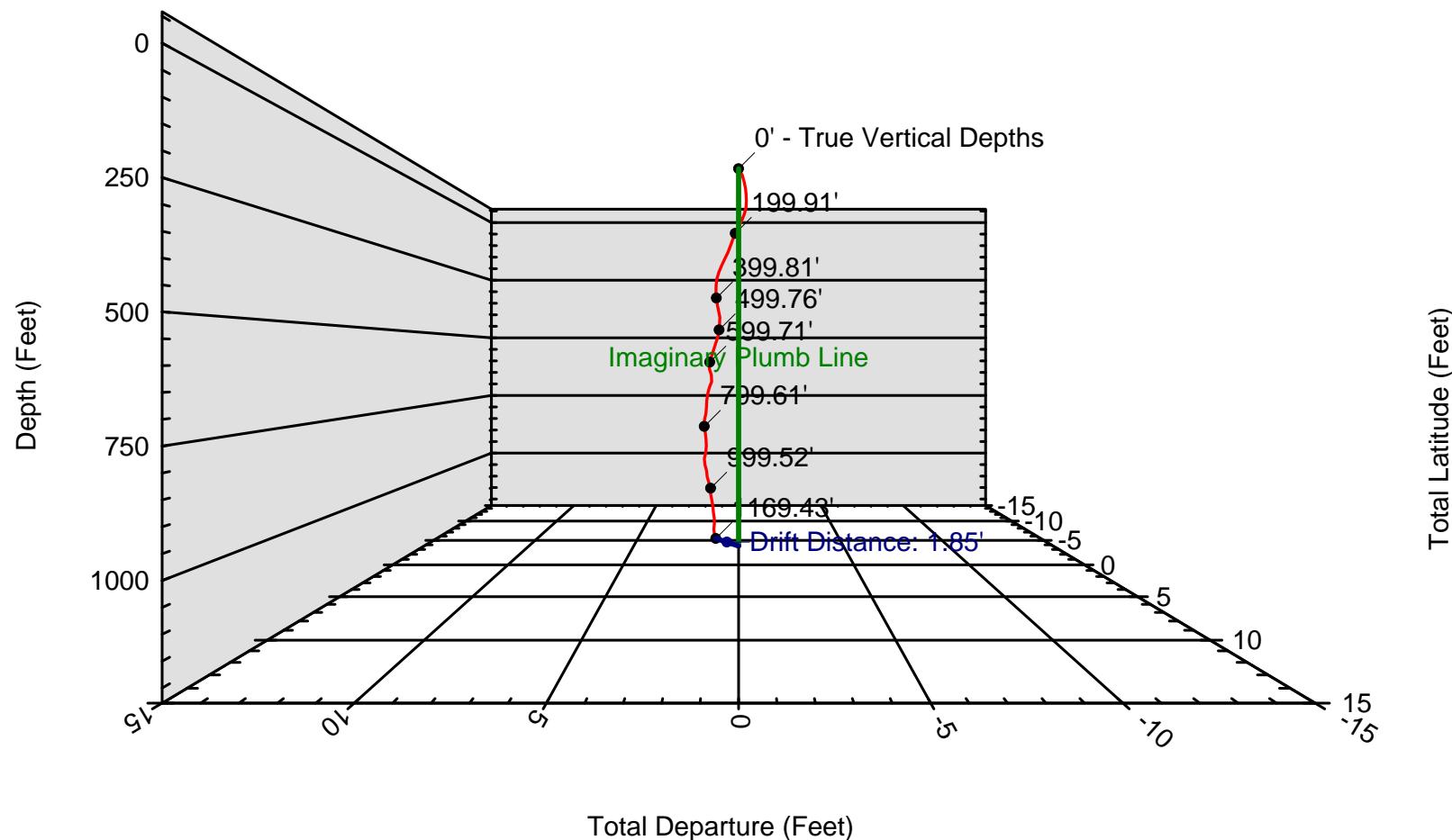
Florence Copper

Drift Distance = 1.85 Feet

Drift Bearing = 146.3 Degrees

True Vertical Depth = 1169.43 Feet

0.0



Date of Survey: Wednesday - March 21, 2018

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

POLAR VIEW - I-02

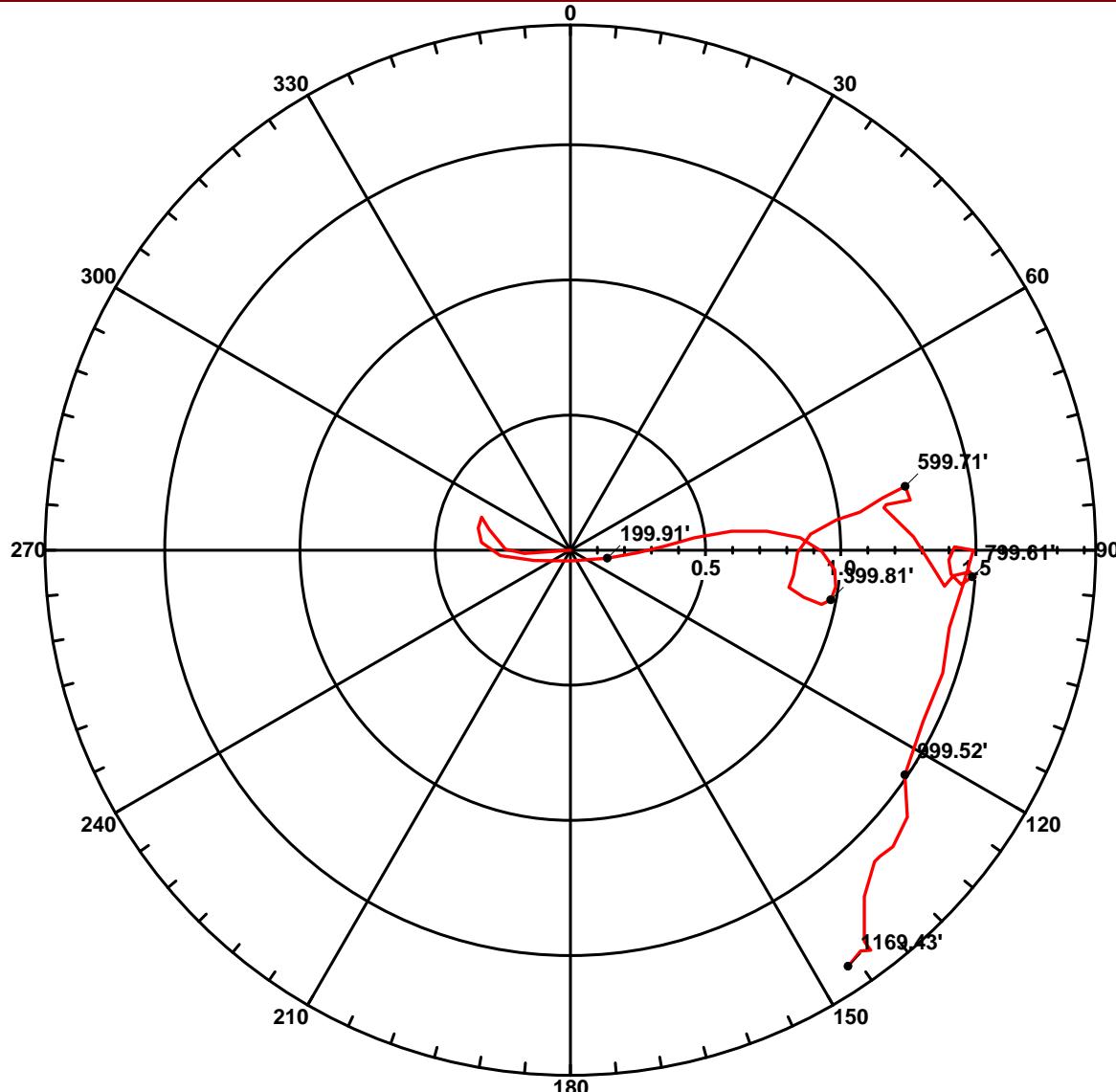
Florence Copper

Florence Copper

Drift Distance = 1.85 Feet

Drift Bearing = 146.3 Degrees

True Vertical Depth = 1169.43 Feet



Date of Survey: Wednesday - March 21, 2018

Balanced Tangential Calculation Method

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EASTING RECTANGULAR VIEW - I-02

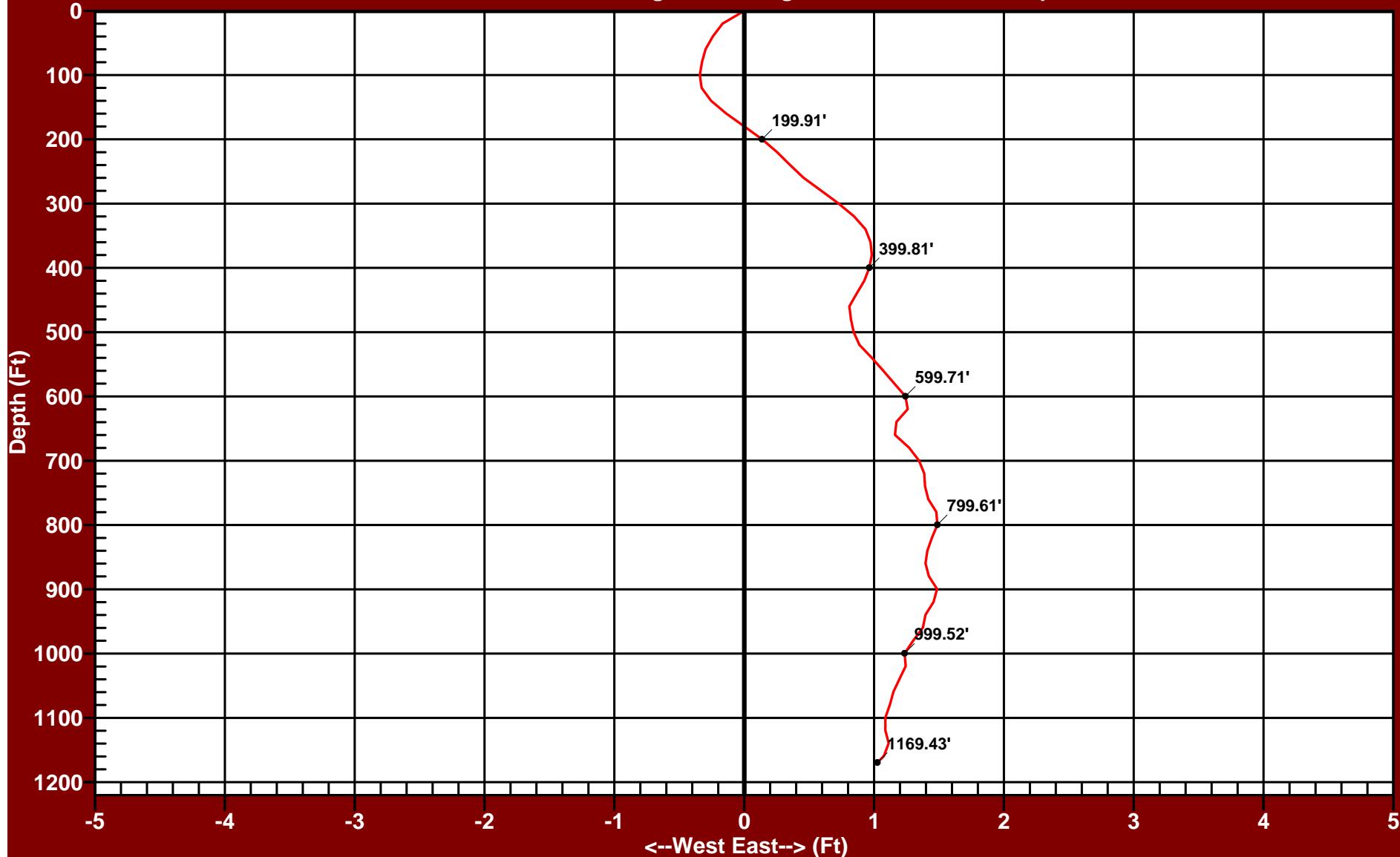
Florence Copper

Florence Copper

Drift Distance = 1.85 Feet

Drift Bearing = 146.3 Degrees

True Vertical Depth = 1169.43 Feet



Date of Survey: Wednesday - March 21, 2018

Balanced Tangential Calculation Method

Southwest Exploration Services, LLC (480) 926-4558

NORTHING RECTANGULAR VIEW - I-02

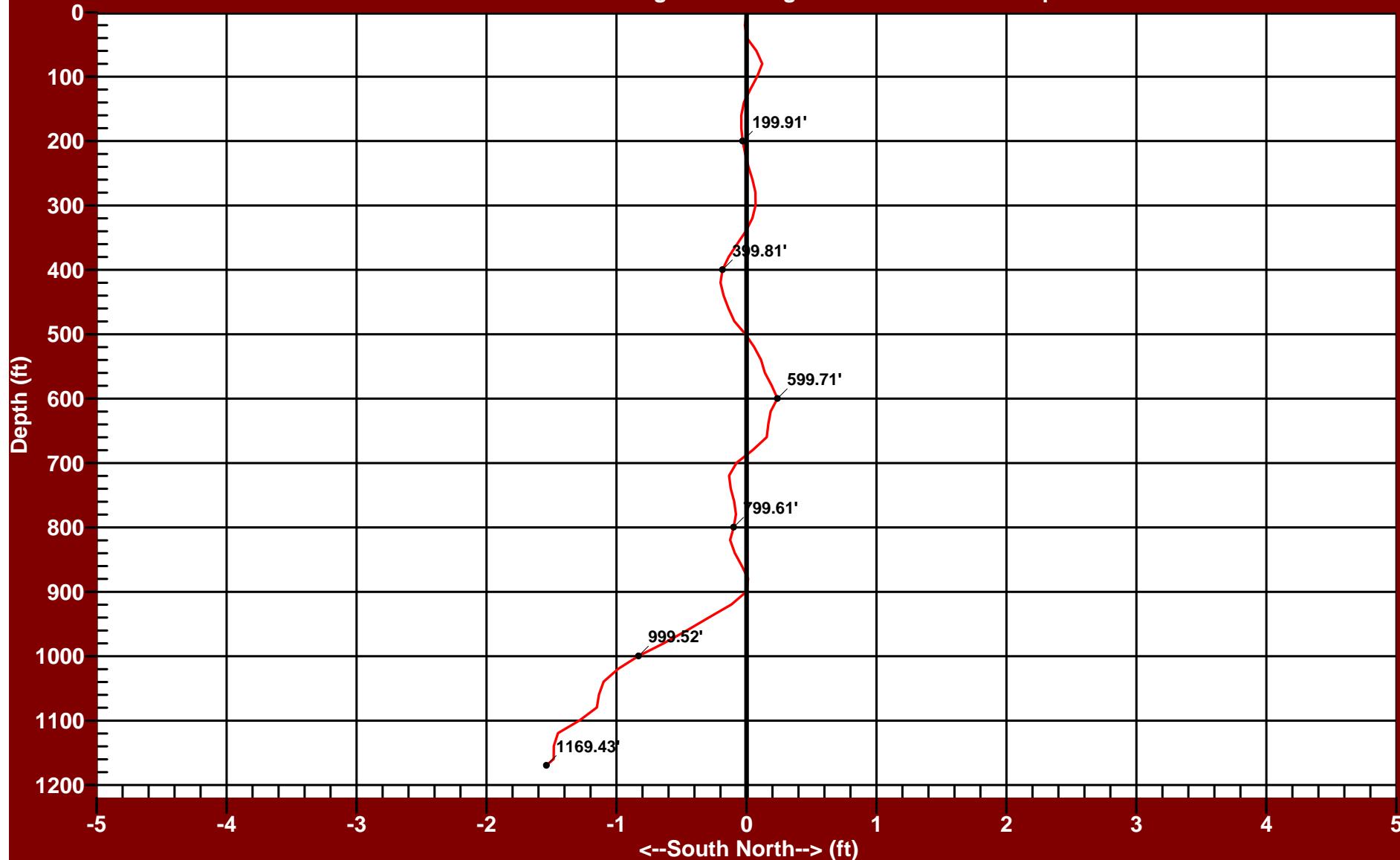
Florence Copper

Florence Copper

Drift Distance = 1.85 Feet

Drift Bearing = 146.3 Degrees

True Vertical Depth = 1169.43 Feet



Date of Survey: Wednesday - March 21, 2018

Balanced Tangential Calculation Method

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